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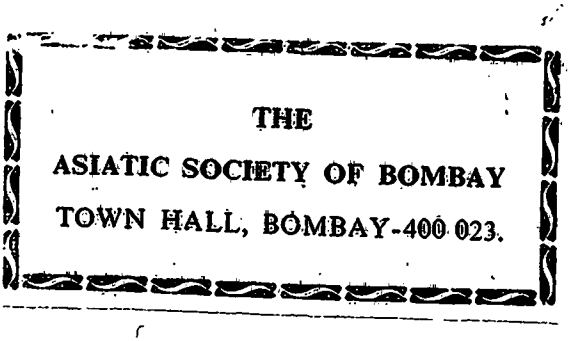
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THE STUD FARM.

LONDON:
SPOTTISWOODES and SHAW,
New-street-Square.

THE

STUD FARM;

OR,

HINTS ON BREEDING

FOR

THE TURF, THE CHASE, AND THE ROAD.

ADDRESSED TO
BREEDERS OF RACE-HORSES AND HUNTERS,
TO LANDED PROPRIETORS,
AND ESPECIALLY TO TENANT FARMERS.

BY CECIL.

LONDON:
LONGMAN, BROWN, GREEN, AND LONGMANS.
1851.

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PREFACE.

For more than five and twenty years, the author of this little work has been engaged in the management of horses; and as during all that period he has never neglected any opportunity of acquiring practical information on every point connected therewith, he is not without hope that he may be able to throw out a few hints on this subject, that may be worth the reader's attention.

To extensive and experienced breeders, he cannot expect that many of his suggestions will be new; though, possibly, even they may "cull a spray" that may be useful. But the less practised, he trusts, will find in this little volume many hints which may be turned to good account. To the farmer, especially, the author desires to address himself, and would earnestly call his attention to a source of profit which, if zealously pursued, will assuredly exceed most, if not every other speculation coming within his province.

It requires no political economist to prove that,

if there is any commodity for which the demand is certain, that commodity must be worth producing. Now good horses command as high, if not higher, prices than ever in the home and foreign markets. Hence any farmer who will devote his attention to "Breeding" will not be disappointed; that is, provided he enter upon it with spirit and perseverance. It is often said that farmers cannot obtain sufficiently remunerative prices for the horses which they rear. But the reason is obvious;—they do not breed from the right sort, neither do they take sufficient care of their stock. To describe the sort that ought to be produced, and to explain the treatment which horses require to render them valuable, is the chief object of the present labours of

CECIL.

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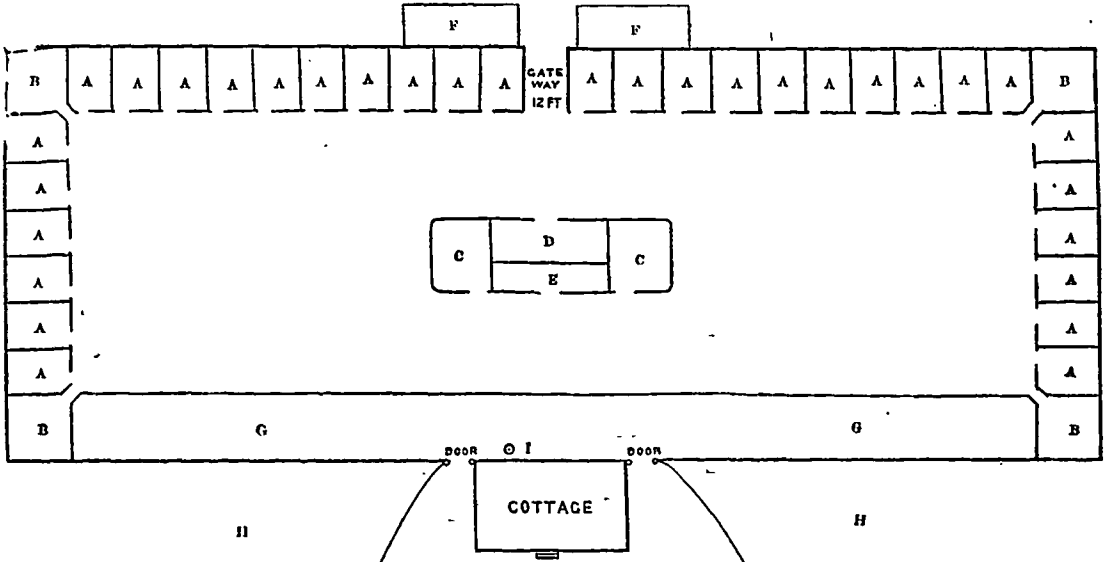
PLAN FOR THE BUILDINGS OF A STUD FARM.



A, Loose boxes, 16 ft. by 12 ft. B, Loose boxes, 16 ft. by 16 ft. C, Loose boxes for mares to foal in, 18 ft. by 16 ft.
D, Bay for hay or green food, granary above, 20 ft. by 10 ft. G, Sheds, 16 ft. H, Garden or paddocks. I, Pump.
E, Room for breaking tackle, &c. (This may be divided if thought more convenient), 20 ft. by 6 ft. F, Receptacles for manure.

THE

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—Windows. — Surface of the Yard. — Paddocks. — Open Drains deprecated.—Inequality of Surface considered. — Size of Paddocks.—Fences.

EVERY circumstance connected with the Turf has acquired such general interest, that the most minute particulars are investigated and scrutinised with attention. But independently of the class of horses exclusively adapted for racing purposes, those which may more immediately form a portion of the agriculturist's stock demand our especial notice.

There are at the present period two most cogent reasons for asserting that horses are the most profitable stock a farmer can breed; first, the very low price which grain produces at market; and, secondly, the value which horses maintain. It is not necessary, in these pages, to discuss the policy which has reduced farming speculations to their present condition; but, in pointing out the means by which an agriculturist can raise any description of stock that will repay him, a more substantial benefit will be conferred upon him than by the repetition of arguments, which have no weight with those interested in other vocations, and whose opinions are at present unquestionably in the ascendant.

During the last ten years the thoroughbred stock which has been reared, has been on the increase, while horses calculated for pleasure, or

business, have not been so extensively produced. There are obvious reasons for each of these events. The encouragement that has been given to racing has promoted the first object, and the apprehension of railway travelling superseding the use of stage coaches, led to the idea that there would be no market for the immense numbers heretofore required for that purpose, and hence that a great number of pleasure horses, or those used by private individuals, would be dispensed with. The expectation that the stage coaches would be run off the road by the united powers of fire and water, has been fully realised; albeit there was something of delusion in the argument that any profit could ever accrue to breeders of horses, in consequence of the demand which formerly existed on the road. They were not generally employed for that purpose, until accident or blemish had reduced their value, plain or badly shaped ones excepted. A coach proprietor seldom gave a breeder a remunerative price for a horse merely to work him up. Nevertheless, when the immense numbers of horses now used to convey travellers from railway stations to the various towns and villages in the vicinity are considered, it will be found that there are nearly as many kept as during the time of the stage coaches. There are infinitely more persons in private life who employ horses for pleasure and convenience

than ever there were, and the demand from that source is therefore not only increased, but it is certain to continue, encouraged by the moderate price of hay and corn.

One of the main points urged by a farmer against breeding horses is, that he has to wait so long for a return of his capital. That assertion is readily met. In the first place, if he cannot command an adequate capital, he cannot embark in a more injudicious speculation than that of agriculture. In the next, how much longer has he to lie out of his money by breeding horses than bullocks? The latter are not fit for the butcher till they have attained from three to four years. The cost of rearing a bullock is nearly equal to that of rearing a horse, till they have respectively arrived at the age of three years. The cost of fattening a bullock, which requires six months or more to accomplish, is greater than is requisite for the keep of a horse during a similar term at any period of his life; for the former will readily despatch one peck of oats or barley, five-and-twenty pounds of hay, with five or six pounds of linseed, per diem — more than double the quantity of hay and linseed that a horse will consume; and a peck of oats is more than a horse requires, unless in work. A good bullock, when fat, is worth about twenty-five pounds — and he can never be expected to realise a vast deal more.

An inferior horse, of the same age, is worth quite as much money; and a superior-shaped hunter or carriage horse will fetch three or four times that sum, especially if he be kept till he is a year older, which will not cost an equivalent difference; and a very first-rate horse will occasionally produce from 150*l.* to 200*l.* Racing stock is of course not included in this category.

A great number of farmers have abandoned the pursuit of breeding horses in consequence of what they denominate ill luck; but they have not set about it in the right way. They have made an injudicious selection of mares and stallions, the produce of which have been badly kept; to save expense, as they have erroneously supposed, the stock has been turned into pasture fields during the summer months to acquire pot-bellies and misshapen limbs deficient of muscle. Under such treatment the frequent occurrence of accidents occasioned by their getting out of the fields has been the constant cause of expense and disappointment. In the winter, the only asylum for shelter has been the farm yard, where, in company with the cows, the roughest food has been offered to them, and if a feed of corn per diem has been allotted to each colt, that was considered quite sufficient, and thus they became emaciated. Few animals, so treated, are worth a twenty pound note at four years old, yet the quantity of land,

the produce of which they consume, is considerably more than is necessary for their keep under proper management. By well manuring the land, and cultivating artificial grasses, for consumption during the summer months, double or treble the quantity of stock may be reared, in the best possible condition, on the same acreage that will afford bare sustenance for animals turned out to graze. Unless a farmer will determine upon keeping them well, he had better never attempt to breed horses, or, in fact, any other kind of stock.

It may operate as an additional stimulus to the agriculturist to devote his attention to breeding this kind of stock, when it is observed that while foreigners are suffered to compete with him in any kind of produce he can raise, as regards horses, he can be under no apprehension of rivalry, from the incontrovertible fact that no country in the world can breed horses of equal value with those of the United Kingdom.

On the present occasion it is unnecessary to inquire from what source the English race horse is derived,—he has now become naturalised to this country, although not indigenous to the soil. That the climate, and the treatment which he receives, are conducive to his well-doings, and suitable to his constitution, are facts to which must be attributed the superiority which he possesses over the horses of all other nations.

Care, attention, and judgment, during a series of years, have contributed to improve the condition of an animal above that which he enjoys in a wild or native state; and, with judicious treatment, there is ample reason to expect that the breed of English horses is still capable of improvement. What effect the present usages of the turf may have in retarding that improvement, offers an ample field of discussion. But whether the present system of racing is calculated to encourage that class of horse which is of most value for other purposes, is a question with which it is useless to deal, because all the arguments I could adduce against it, and these are many, would be of no avail, as they could not change the current of fashion. It is sufficient for a breeder, whose object is racing, if he succeeds in breeding such horses as are remunerative. If it is his intention to breed animals of another class, and he makes a profit by them, his purposes are answered.

The speculation of breeding may be divided into two classes, — the one of such horses only as may be calculated for racing or steeple chasing, when some will be found worth training, others valuable for the saddle, and some quite useless (a man must not calculate upon holding a handful of trumps every deal)—the other for hunting, road, and harness work. The ostensible motive which

in either case will assuredly prevail is profit. Racing is the test of breeding, and that breeder who exercises the greatest judgment will, in the long run, obtain the greatest success. To suppose that breeding is dependent entirely upon chance, is an absurdity. Events may, and doubtless will occur, to baffle human foresight; but they will act as cautions for future guidance. Discrepancies, frequently set down as the caprices of Nature, may often be accounted for, if people will take the trouble to search deep enough into the mystery.

The first consideration in the formation of a breeding establishment is its situation and aspect; for unless those points be attended to, success cannot reasonably be anticipated. Dryness of soil, and a clear but not bleak atmosphere, are most essential. Districts where fogs prevail, and all tendencies to local humidity, are peculiarly adverse to the healthy state of the equine tribe. Many years since I was taught a lesson on the importance of situation. I occupied two paddocks in Shropshire, the soil of which was a sandy loam of fair quality, and although they were not far apart, the difference in the condition of the mares and foals occupying them was most apparent. Of course they were all fed alike, and when the inmates were exchanged from one to the other, a corresponding alteration in the appearance

of the animals became very shortly perceptible. The paddock in which they did not thrive was enclosed by a brick wall, and to the eye appeared to possess every requisite,—in fact, it seemed preferable to the other. It was screened from the northern aspect by rising ground and the house, and sheltered also by trees, which I believe far from being beneficial were the reverse, by rendering the atmosphere damp, — the ostensible cause, no doubt, of the unhealthiness of the situation. The hovels opened to the north, which I considered to have been another cause of evil. The other paddock, which I found to be so much superior, was more open; it contained three hovels placed in a row facing the south, an aspect which should always be selected for such buildings. Both paddocks were drained.

The stabling, likewise, which at that time I used for hunters, afforded an equally striking evidence of the effect of aspect. One, consisting of three stalls, lofty and commodious, erected by a previous occupant, "regardless of expense," was immeasurably inferior to another building near at hand, which I converted into loose boxes, presenting a far less aristocratic style of fitting up and appearance than the three-stall stable; but the boxes were in every respect all that I could desire, as far as their habitation could effect the

condition of the horses by which they were occupied. So great was the distinction as to induce me to abandon the use of the three stalls for hunters, or even for horses of an inferior class, if I could find room elsewhere. It was so situated as to be almost constantly secluded from the rays of the sun; the door and one window faced the east, and originally another window, which I bricked up, faced the north; verily, nothing could have been more injudiciously planned. The door of the boxes opened to the west, and they had the sun almost continually shining upon them, whenever we were favoured with his cheering rays; an influence which the three stalls did not enjoy, but which should be courted with the greatest assiduity.

Light, dry, sandy soils are evidently the most conducive to the healthy condition of the equine tribe; but in this selection I do not include the black peaty sands approximating to bogs, or which, in point of fact, are bogs partially reclaimed by draining, surrounded by large tracts of land in their primitive condition; for in such situations humidity of atmosphere invariably prevails, most prejudicial to the health of the horse. Such land is found in the neighbourhood of Ascot, Bagshot, and the surrounding country, where fogs most prevail. Very few, if any, horses are bred in that locality.

Those situations where chalk or limestone forms the substratum are eligible, also dry loams; but strong clays are exceptionable for this reason — they are retentive of superficial moisture to a great extent in wet weather, and during the dry periods they become excessively hard, both of which extremes are injurious to the legs and feet.

In any case, unless it has been previously performed, the land used for paddocks or yards to be occupied by blood stock, or horses of any other description, as well as that upon which their food is raised, should be thoroughly drained. The humid, rich pasture land found in many districts producing gross succulent herbage, adapted as food for young or fattening cattle and cows, is not to be selected for the horse. Such productions may tend to augment the quantity of a mare's milk, but at the same time it will have a prejudicial influence on the quality; a most important consideration in reference to the welfare of the young foal, as I shall endeavour to illustrate in future pages.

The most intelligent and able agriculturists have decided that the best system of rearing cattle is that of keeping them in yards or enclosures, well sheltered with suitable buildings, where food is regularly supplied to them throughout the year,

green crops being provided to be mown for the purpose during the summer months. It is, no doubt, a system far preferable to that of turning them out at any time in pasture fields, because the food goes so much further, the cattle are more quiet, less exposed to accident, and the annoyance of flies and other insects which torment them in hot weather. Moreover, the vast amount of valuable manure that is collected, and the soakage secured in tanks, admits of an increased quantity of stock being kept on a given quantity of land. The great obstacle of the system of rearing cattle according to the above-mentioned system, arises from the want, on most farms, of suitable sheds or buildings. Prejudice in favour of old customs may likewise in many instances prevail; but these are times when prejudice must give way to reason, or the evil consequences will be seriously felt. In the arts and sciences, manufactures and commerce, the march of improvement makes rapid strides; if the occupiers of land do not bestir themselves, and endeavour, at least, to follow if not rival their fellow men who congregate in towns, their relative position in social life must undergo a mortifying change. If the practice be good, which no doubt it is, of keeping cattle in yards and sheds all the year round, it is of much greater importance in the management of

a breeding stud, and the profits will assuredly be more remunerative. I do not mean to advise that young colts are to be kept in a positive state of confinement, a course adopted by some breeders of racing stock, but which, from experience and reflection, I believe to be most erroneous. I would recommend paddocks from one to three acres in extent, in which they should be enlarged a few hours daily during fine weather. Exercise is necessary to promote the development of muscle and increase the strength of horses, although it is not essential to the well-doing of cattle, to whom quietude and repose are more beneficial in order to promote a propensity for the accumulation of meat.

Three or four fillies or geldings may be turned into the same paddock together, by which arrangement a small tract of land will suffice as the playground for a considerable number. Thoroughbred colts which have not been castrated will, of course, require separate enclosures. The number and size of these paddocks must, of course, be regulated by the magnitude of the stud. At the same time that there is no objection to it, it is not essential that any grass or pasturage should be cultivated in them; in fact, if they are constantly occupied by any number of horses, they will be sure to destroy nearly all the vegetation. Air and exercise are in this case the only objects in view.

Hence, another reason for asserting that grazing land is not at all essential for the use of a stud farm, and that many of those agriculturists who occupy arable farms, which at the present crisis cannot be made remunerative by the cultivation of wheat and barley, may convert their land to profit by breeding horses. In corroboration of this I will cite an example worthy of notice. When the late Lord George Bentinck (whose experience in such matters was unquestionable) commenced breeding race horses on an extensive scale, his principal establishment was at Danebury, where he formed paddocks, and erected such buildings as were required. For the information of those who are not acquainted with the spot, it is necessary to mention that Danebury is surrounded by arable land and extensive downs of a dry character, with a substratum of chalk. His lordship, as all the world will acknowledge, was too good a judge not to have made a suitable selection, and having to incur the expense of fencing round the paddocks and constructing the buildings, there can be no doubt of his having chosen that spot as being well calculated for his object.

When a breeding stud of any magnitude is about to be formed, it will be requisite to erect suitable buildings, or render those which may be in existence convenient for the purpose. Two arrangements present themselves; one having the

boxes and such like constructions surrounding an extensive yard; the other that of building boxes or hovels in the paddocks, dependent upon circumstances, such as the taste of the proprietor, and the size of the enclosures; when the advantages and objections attendant upon either arrangement are fairly considered, they will perhaps be pretty equally balanced, giving a preference possibly to the first plan; yet, when circumstances will permit, the most desirable course is undoubtedly to be provided with both; that is, a homestead, and a certain number of the paddocks supplied with hovels. The principal objection to having all the boxes together, appears to exist in the trouble, and perhaps some trifling amount of risk attendant upon taking the stock backwards and forwards to the paddocks. Much of this, however, depends upon the distance or contiguity of those enclosures. If the hovels are in the paddocks, it must be remembered there will be a trouble incurred of supplying the stock with hay and corn at certain intervals of the day, with the disadvantage of some waste of provender, or, perchance, occasionally of its misappropriation. For the accommodation of a small establishment the existence of old buildings will, in all probability, influence the determination. Hovels in some of the paddocks will unquestionably be found useful for the accommodation of brood mares whose vicious dispositions render them un-

safe in the company of their own species. That, however, is not very commonly the case; for, in justice to the species, it must be said that they are social creatures, and may generally be trusted in lots of four or five, which, in large establishments, with enclosures of adequate proportions, will be found a great convenience.

If I were about to erect buildings for the purpose of a stud farm, I would have them arranged as nearly as possible after the following plan. Fronting the south should be the cottage or residence appropriated to the use of the stud groom or principal having the management of the establishment, the arrangement of which it is not necessary to give in detail, but in some convenient outbuilding connected therewith, conveniences for boiling water and preparing linseed are indispensible. The cottage facing the south will thus occupy that portion of the yard which, if fitted with boxes or hovels, would have a northern entrance,—at all times to be avoided. Surrounding the yard, boxes or hovels must be erected in number according to the proposed magnitude of the stud; and as a southern aspect is preferable to any other, it is desirable to arrange the proportions of the yard as much as possible to attain that desideratum. Each box or hovel ought to measure twelve feet by sixteen feet. At the corners of the yard it is convenient to have a large hovel for

mares to foal in, or for use on particular occasions. A building in the centre of the yard containing an apartment for an attendant, with a large box or hovel on each side, also, for the convenience of foaling mares, or in case of indisposition requiring constant attention. This edifice may contain a granary entered into through a room for hay; and by having the granary at the end of the attendant's apartment, an arrangement can readily be effected to supply a bin or receptacle with a certain quantity of oats, to which he could have constant access. The other portion of this building may be set aside for straw, or sheds may be provided on the outside. The doors to the boxes or hovels, and the hay and straw compartments, by being placed at the corners, and cut off, would be the means of avoiding accidents which frequently occur where there are angular projections. The entrance to all the boxes should be on the left hand, as it affords most space, and the doors, which should be four feet wide, should be constructed to open outwards; there should be hooks in the wall to keep them back during the ingress and egress of the inmates. Rollers should be placed on the door cases to prevent accidents in passing and repassing. If the doors are cut through transversely at the height of five feet, the upper portion being secured with iron bars, they may be so contrived as to be thrown open in hot wea-

ther; but by no means are such doors to be recommended without the protection of the iron bars, as many instances have occurred of mares and foals endeavouring to leap through half-doors, and of course by so doing seriously injuring themselves.

One of the principal features in the good arrangement of buildings for the purpose of sheltering horses in is ventilation. A moderately warm, at the same time dry, temperature is necessary for the health of these animals; to promote which, some measures must be adopted to allow the escape of foul air, but without admitting currents of air to come in contact with the inmates. Holes in the walls are frequently formed, having little wooden shutters to slide backwards and forwards as occasion may require; these should be as high as the side walls will permit. There should be also tunnels through the roof, made with four boards from nine to twelve inches wide, with cupola tops to prevent rain from descending. One of these may be so arranged as to afford ventilation for two boxes which are contiguous to each other, and I believe them to be the most effectual of any. If the walls, and consequently the roof, be lofty, they may, probably, be dispensed with, and the apertures in the walls only adopted; but the most complete and satisfactory plan is to be provided with both, as either can be closed at pleasure. Most

persons are willing to acknowledge the importance of ventilation; and yet many buildings, appropriated to the use of horses, are very imperfectly constructed in this respect. It may, therefore, appear necessary to add a few more words on this important subject, the result of investigation made by an acknowledged authority. Boussingault calculates that the horse consumes thirteen pounds three and a half ounces of oxygen in twenty-four hours, which is used in converting the carbon into carbonic acid. Presuming, therefore, that the same excess of oxygen is consumed by the horse that is consumed of carbon, according to the experiments of Boussingault, a horse requires more than five times the amount of fresh air essential to the vital process in man; and, furthermore, when it is observed that the air in a confined room or building, that is, where no admission of fresh or atmospheric air exists, becomes contaminated and deprived of its vital properties by the process of inspiration and expiration, how important it must appear that horses should be kept in apartments very perfectly arranged for the admission of fresh, and the escape of foul air, which being expanded by heat and contracted by cold, the amount of oxygen is unequal under different temperatures. A moderate degree of warmth is essential to the healthy condition of the horse. It therefore follows, that a considerable amount of ventilation

must be provided, in order to supply the vital principle of the atmosphere. During every moment of life animals are taking in oxygen by means of the organs of respiration; but no part of that oxygen remains in the system; it is given forth in the form of carbon and hydrogen, commonly called sweat, by exhalations from the skin, and the ordinary evacuations. The number of respirations is regulated by the extent of exercise or work. Every man acquainted with the treatment of horses is aware of the consequence which follows from bringing them into confined stables or buildings.

When about to erect new buildings, the material of which they are to be constructed becomes a matter for consideration. The selection will, in some measure, be determined by locality; in other words, the productions of the district. Economy and durability are two important considerations. In those countries where a slaty kind of stone abounds, provided it is not so soft and porous as to cause the buildings to be damp, it may be brought into use very advantageously. Much of this is found in parts of Oxfordshire and Gloucestershire, especially on the Cotswold hills. Where this is not to be obtained, for substantial work bricks will bear the palm. Temporary hovels may be built with gorse; in which case flakes, made with rods similar to the hurdles used in some

countries, formed in panels to fit the frame-work, usually protect the interior; but they are very fragile, and a kick injures them. Elm slabs might be substituted with good effect. Very neat, indeed ornamental, hovels are constructed with fir poles sawn asunder, placed perpendicularly, and faced externally with a round and flat surface alternately, by which means the flat surfaces come together, and being sufficiently lapped over and carefully joined, will be thoroughly air tight. Two coats of the pine varnish on the outside will preserve them from the effects of the weather. It has an infinitely better appearance than that abominable production, gas tar, which becomes soft in hot weather, when it adheres to everything which comes in contact with it; but besides that, I believe it to be exceedingly offensive to the olfactory nerves of the equine race, and, consequently, highly injurious to mares in foal, as rendering them liable to premature labour. Where chalk can be procured, it forms excellent walls for outbuildings, and, if properly constructed, is very durable. It is, however, indispensably necessary to protect the inside with boards from four feet six to five feet high, if horses are to be lodged in the interior. It is, no doubt, particularly conducive to health, and neutralizes the acidulous salt produced in stables. Clay may also be brought into use if near at hand at a very trifling expense.

The inside of the building being formed with boards, on the outer side, at the distance of one foot, flakes made with rods are firmly fixed, and the intermediate space filled up with well tempered clay and rammed as the work proceeds; it should be thoroughly softened with water, so that portions of it may be forced through the apertures in the flakes; the exterior is then coated over with common plaster and white-washed, which gives it a very sightly appearance, and will last many years. The worst description of hovels that can be constructed are those which are formed with weather-boarding, which very soon warps, presenting interstices for the admission of the wind; cold draughts are thereby admitted, which ought at all times to be most sedulously guarded against.

I have been thus profuse in enumerating a variety of materials for the construction of outbuildings, as there are some localities in which they are available at a very trifling expense, and which may answer the purpose for a small establishment; but in a general way bricks are unquestionably the best materials, and as the duty upon them is reduced, their cost is now somewhat less than formerly.

For the roofing of all buildings to be occupied by horses, nothing appears to be better adapted than thatch, being less obnoxious to the changes of atmosphere than slates or tiles. Slates certainly

present the nicest appearance, and they admit of a flatter roof; but when the rays of the sun strike upon them in hot summer weather, they reflect a degree of heat almost insufferable; during cold rains, frost, and snow, they are subservient to extreme chilliness. To obviate this, the rafters should be ceiled inside — a precaution also necessary with tiles. Either of the latter are, of course, more durable than thatch, which has the disadvantage of being liable to harbour rats. The material of which the walls are formed may, in some measure, determine this question, slates or tiles being the usual companions of bricks.

We now come to the very important consideration of the material with which the paving or bottoms of the buildings are to be prepared. Architects in general propose bricks; but they are very objectionable on account of the exceedingly smooth surface which they present. When horses are rising from a recumbent position, they are very apt to slip and strain themselves, from want of foot-hold. In a state of nature, a comparison quite admissible on this occasion, the horse always finds a resistance for his hind toes in the earth on which he lies. Many a lameness, the cause of which could never be satisfactorily accounted for, has had its origin from the animal slipping when in the act of rising. It is in all cases desirable, when a horse meets with an acci-

dent, to ascertain the cause, not only as regards certain indications to be derived from that knowledge, which will direct, to some extent, the applications or remedies best calculated to promote a cure, but to prevent a recurrence of the evil. It is so clear to any one who will take the trouble to observe a horse in the act of getting up, that he requires a fulcrum for the toe of the hind foot, from which he may make his spring, or effort to raise his hind quarters, that it is extraordinary any one having regard for the safety of his stock should permit the apartments specially appropriated to the repose of the animals to be so constructed as to be constantly pregnant with danger. For this reason, small stones, neatly and nicely laid in sand, form the most eligible paving for all descriptions of buildings in which horses are to lie down. The more level it is laid the better, provided there is sufficient fall for the water to run off, declining to the outer wall, where there should be a grating over a drain, to allow the escape of any moisture, but of which there will be very little when the litter is carefully removed and replenished at proper intervals. Drains carried to the centre are objectionable, inasmuch as they convey a current of air to that part where the horse is usually either standing or reposing; but if placed close to the wall, no such inconvenience is produced; besides which they assist ventilation.

The fittings or furniture required in boxes, hovels, or, in fact, any kind of stabling, cannot be too simple; and they should be as few as possible. The ostentatious display of variety incurs expense without utility. Any projections or ledges which the inmates can take hold of with their teeth, and be thereby induced to contract the abominable habit of crib-biting, should be studiously avoided. A well for the hay is certainly preferable to a rack; the only objection I ever heard advanced against the former being, that horses will turn over the hay so offered to them with their noses, and, by blowing upon it, render it unpalatable, thus creating waste. This they may do to a certain extent, but it is a mistaken notion respecting waste. If given to them in racks, they will frequently pull it out and tread it under their feet, when much of it is soiled and carried away with the refuse litter. Moreover, when placed in a well or manger, the hay is in a position more natural to the horse than in a rack: it is his custom to feed from the ground, not to browse the trees, with which habit racks appear to be more in conformity. There are certain propensities and functions of the animal, in a state of nature, which it is desirable should be assimilated as nearly as possible in a state of domestication. The usual materials for mangers are slates, quarries, iron, or oak, the superiority of which may be estimated

in similar rotation to that in which they are enumerated. Excellent mangers are formed of slate, especially when made out of one solid block; but they can only be procured in that fashion at the quarries, from which, if the distance be considerable, the expense of carriage is a consideration. The mangers should be hollowed out something after the form of a pie-dish, with an excavated rim at the upper edge, to prevent horses from throwing the corn out; and, with a similar view, they should be of considerable depth; the bottom should be worked quite flat. A tolerably large-sized manger is at all times to be preferred, as many persons entertain an opinion that when the corn is spread thinly over a large expansive surface, it is a means of preventing greedy feeders from bolting their oats without thoroughly masticating them. Although not quite in a condition to acknowledge the truth of this assertion to the full extent, it may assist in a very trifling degree. The front part of all mangers, whatever material they be made of, should be sufficiently thick to prevent horses from gnawing them; and they should be made round. If of wood, they should be protected with iron. Very superior mangers are made with slabs of slate — the only inferiority which they present, compared with those made from blocks, consists in the corners or angles, which prevent their being kept so scrupulously clean, a desidera-

tum of the utmost importance, affording a substantial reason for recommending solid *slate* in preference to any other material for this purpose. Wood is open to the same objection with respect to angles and corners, with the additional one of being so much more porous, consequently permitting the adhesion of any wet or moist substance, especially of bran-mashes, which form a considerable portion of the dietary of brood-mares and young stock. Such mangers, therefore, should be chosen as are capable of being most readily and perfectly cleaned. If particles of bran-mashes are suffered to remain along the edges and corners of mangers, where horses cannot reach, they soon become sour and offensive to these delicate-feeding animals, independent of which the food afterwards offered to them becomes contaminated and unwholesome. Iron mangers are much in fashion, but they are seldom made deep enough or sufficiently flat at the bottom. An improvement has lately been introduced, by lining them with a kind of white ware, which I have no doubt answers a good purpose; but many people object to iron for mangers in consequence of its being very cold. Hard red quarries are often used, the front of the manger being formed of a semicircular piece of cast iron, representing the half of a pipe; it possesses one recommendation, that of not being enticing to horses to take

hold of with their teeth; but as the quarries cannot be laid without the angles already deprecated, they must give place to the solid blocks of slate.

Apart from the nicety requisite in offering food to horses, and the importance of thoroughly cleansing, at all times, the apparatus from which they feed, there is another very important consideration, that of being able to purify thoroughly every part of their habitation in the event of illness. The mangers are on such occasions of paramount importance. The exudations of offensive mucus, which prevail in cases of colds and strangles, should be most scrupulously extirpated, but this cannot be performed so effectually from wood as from slate, quarries, or iron.

The influenza is a malady always to be regarded as contagious, and it is one which will, at times, attack the best regulated studs; being contagious, and therefore likely to affect healthy animals if placed in stables previously occupied by invalids, it is of the utmost importance that such buildings should be so constructed as to admit of purification to the utmost extent, and with the greatest facility. Chloride of lime is the best disinfectant that can be used, and should always be applied to the mangers when influenza or strangles have made their appearance.

Receptacles for water should also be provided, so that brood mares may have constant access to

it: and any contrivance by way of pipes, which the position of the buildings will admit, is far preferable to the labour incurred by carrying the water to replenish them.

Each box or hovel should be furnished with a window, which should be placed sufficiently high as to be secure from breakage: to guard against accidents it should also be protected with iron bars. If made to open and shut, it may be used for the purpose of ventilation when required. The most convenient plan appears to be that of hanging it upon a pivot or axis, by which means it may be opened to any extent, and shut at pleasure.

Before concluding the arrangements for laying out the stud farm, we must advert to the material with which the space in front of the boxes is to be covered. The choice will, I think, be in favour of tan. Gravel may look neater; but it is objectionable from its liability to insinuate itself into the clefts of the tender frogs of foals, and thereby engender thrushes. Straw may be the substitute if tan is not easily procured; but, as that space may be required in stormy weather for the occupation of a few mares and their foals during an hour or two of the day, when the elements prohibit their being taken out into the paddocks, it is evident that nothing in the fashion of paving is admissible. Here I must

remark, however, that, much as I am opposed to the carelessness of allowing foals or young stock to be exposed to rain, I am still more adverse to having them shut up, unless imperatively compelled by the inclemency of the weather.

Passing now to the arrangements of the paddocks, enough has already been urged on the necessity for rendering the soil thoroughly dry, by means of drains: but it may be well to offer a caution upon the danger attending open drains or ditches of any kind. Mares, especially when in foal, and more so as the time approaches when they are about to bring forth, are very fond of rolling themselves on the ground. Lands, raised as they commonly are in Leicestershire, Warwickshire, and other grass countries, are, from the same cause, replete with danger: if a mare rolls over upon her back into one of the hollow parts, it is very probable she may not be able to recover herself without assistance; and, in struggling to do so, will incur serious injury. It will thus be seen that paddocks, having a perfectly smooth surface, are the best adapted for the occupation of brood mares. For colts and young stock it is, however, another affair: the more numerous and prominent the undulations the better; uneven surfaces improve their action, and give suppleness to their limbs. A horse that has never been accustomed to move upon anything but the

smoothest surface of grass, is a helpless creature when ridden over fallow fields and other inequalities. Even supposing that the stud farm is intended solely for the purpose of breeding racing stock, it is highly desirable they should be accustomed to the free use of their limbs to the utmost limits that safety will permit; but, as these pages are intended to convey suggestions for rearing stock for general purposes, it would be an unpardonable oversight to have omitted these remarks.

It will be found most convenient to have a certain number of paddocks ranging from one to two acres; and, if the establishment be extensive, some of larger dimensions: but, as they should be considered exclusively intended for the purpose of exercise, and not for the pasturage which they afford, it is a waste of ground to have them very spacious. No doubt can exist as to what constitutes the best kind of fence: a brick wall is certainly the most durable and effective, but it is expensive. In those districts where stone walls form the boundaries of fields, the same material may be brought into use most effectively. They should be at least six feet or six feet and a half high. Large doors may be introduced with advantage with walls of any kind. The chalk walls already alluded to form excellent fences where that substance is procurable. Strong quick hedges,

formed as they are at Newmarket, are very good, but they require a lapse of some years ere they grow sufficiently strong and high, either for the purposes of shelter or security; during which period it is necessary to guard them with posts and rails on each side: similar contrivances, but made to move away, must also protect the gateway. Gorse or furze planted upon a bank, faced with stone, may be suggested as an excellent fence: horses have a great antipathy to the prickly nature of that shrub, which, being an evergreen, affords as much protection in winter as in summer. The propensity which horses possess of breaking through fences, some more so than others, must dictate the propriety of having them so strong as not only to prevent them from accomplishing that feat, but also of attempting it.

CHAP. II.

SELECTION OF MARES.

Procreation. — The Superiority of Horses of the present and past Ages considered. — Immense Increase of Racing during the last Century.—Consolation to Breeders.— Formation of a Stud.—Causes of Disappointment.—Symmetrical Proportions essential, combined with fashionable Blood. — Attributes enumerated. — Loss and Disappointment averted by judicious Selections of Mares and Stallions. — Importance of Beauty in Hunters and Hacks. — A young Farmer's Idea of a Brood Mare, and his Selection of a Stallion. — Racing Blood.—Aged Stallions and Mares generally most successful. — Sort of Mares to breed Hunters and Hacks.— Extremes objectionable.—Hereditary Defects.

If the ingenuity of man could by any possibility define certain causes which would insure certain results in reference to the procreation of animals, infallible rules might be established. But this cannot be accomplished, and therefore the breeding of all kinds of domestic animals must, in some measure, remain subservient to the decrees of Nature. Still there are many obvious principles which so generally lead to similar consequences, that they may be very faithfully held as acknowledged facts. Nature appears sometimes to thwart man's hopes with little incidents, which at the

first glance are not only unexpected, but seem to be unaccountable; yet a little reflection will clear up the mystery. The union of a black horse with a chesnut mare may give birth to a grey foal; and many similar events may take place, quite as readily to be accounted for when reflection and investigation are brought into action. It is to control, so far as lies in human nature, such results as may be most conducive to profit and convenience, that experience and circumspection are so important to the successful management of a breeding stud.

Much has been written on the question whether the horses of the present day are superior to those which were bred by our immediate ancestors. This is a query which must remain in some doubt, as we can only be guided by the fallacious result of timing race horses; of other kinds, there is no test whatever. It is well known that the qualities of race horses of the same age can only be determined by running them together. How much more delusive, therefore, must be the time test in those comparisons where a series of years has intervened between the respective probations, since we are well aware that such ancient records are less accurate than those of the present day.

One great object in breeding domestic animals, whether they be horses, cattle, sheep, or pigs, has been to improve as well as to perpetuate the re-

spective species. Has so much time, money, and experience been wasted over the first of our domestic animals, the horse, to no good purpose? Candour will, I think, respond in the negative, and upon this reasoning we may surely infer that the present breed of horses quite equals, if it does not excel, those of our forefathers. That they did not bring to the post so many bad horses as are trained and brought out to run at the present time is an incontrovertible fact, but then there were not the same motives in existence. There were not anything like the numbers of race meetings held in those days. In 1750 there are only the records of twenty-two assemblages of this kind, at which no more than sixty-four races were run, and mention is made of seventeen horses which won at minor places. In 1825 there were sixty-six meetings, at which five hundred and ninety-five races took place. In 1850 they were increased to one hundred and four meetings, which afforded one thousand and twenty-five races, besides a vast number of village sports during fairs, wakes, and such like rural festivals not enumerated in the Racing Calendar, fully equal in increase of proportion to the seventeen winners mentioned as having run one century ago; thus the augmentation during that period is in proportion to sixteen fold. Racing, in its early stages, was altogether on a different footing to what it now is. There were

very few handicaps or engagements of that kind yielding remuneration and inducement to cultivate and train worthless weeds. Those contrivances are now propounded to a great extent to the encouragement of bad horses. The nobles of the land, and the wealthy patrons of the turf, who laid the foundation upon which the structure has so prosperously risen, ran their horses from motives of laudable ambition and honour, more than for gain. They only brought their best horses to the post, as those alone had a chance of winning a four miles' race of heats at weight for age. Some consolation to breeders of racing stock is now in embryo in the hope that if they do not succeed in breeding first-rate horses, they may breed those which will pay expenses by winning handicaps, while the stimulus to obtain good horses need not be relaxed, as, under any circumstances, they are capable of being turned to the greatest profit if judiciously managed.

When about to form a stud of thoroughbred brood mares, the first and most certain step towards success is unquestionably to purchase those which have bred good runners. Their foals, if they be the offspring of a popular sire, will always command a high price when offered for sale in the event of their not being kept on for the purpose of training; but the purchase of such mares cannot be accomplished without a very considerable out-

lay of capital, and such as few persons have the means or inclination to invest. Moreover, they are scarcely to be obtained at any price, unless the death of a breeder or some other very imperative event compels the breaking up of an establishment. Mares that have been very excellent runners themselves are often sought after for the purpose of breeding at enormously high figures, and have, in many instances, proved to be the worst speculations; many of them never having produced a foal worth training; and although it is not necessary to enumerate them, a reference to the Stud Book and comparison with the Racing Calendar will bear out the assertion.

It appears necessary to assign some reason for the disappointment which not unfrequently attends the speculation of breeding from mares that have evinced such vast superiority on the turf. Several may be adduced, one or more of which may weigh with the same individual. In the first place it often happens that such good creatures are so severely trained, and so frequently brought to the post, that their constitutions become impaired, some internal malady is established, or the functions of certain members are disorganised, most especially the lungs, when a vitiated condition of the blood takes place, and yet no external appearances will lead to the supposition that there is anything amiss; for it some-

times happens that horses labouring under the effect of internal chronic disorders will carry much flesh, especially when they are not at work. Experienced veterinary practitioners may detect these disorders, but they are not easily discovered by those who have the selection and care of horses in general. The nervous excitement frequently produced by a repetition of severe races has at times a great and most injurious influence over some animals, and which, in many instances, they never overcome. The effects on the constitution are permanent. It may be ascribed to temper, but still it is analogous with the constitution, if severe races, often repeated, cause the functions of the animal to be impaired; under such circumstances the produce may be influenced thereby.

The most practicable, and generally the most profitable and satisfactory, course to be adopted for the establishment of a stud of brood mares for racing purposes, is that of purchasing good shaped animals, combining the most fashionable blood that can be obtained, and which has already been tried in the stud as well as on the turf. Those only should be admitted possessing the recommendation of sound constitutions and freedom from hereditary defects or blemishes, with good legs and feet, uniting the sources of those perfections with the symmetrical proportions of

the body, on which is dependent the position of the legs, and to a great degree their quality. The wear which a horse's fore legs will sustain is greatly influenced by the form of the shoulders, and the union of those members. Action is also very materially governed by the same causes. The goodness of the hind legs is in a similar manner determined by proportions of the loins, thighs, and gaskins, with the hocks, all of which being nicely connected ensure a favourable position of the lower extremities. For it may be received as a general principle that horses not symmetrically proportioned cannot enjoy the requisite qualities of speed, action, and endurance. Symmetry must not, however, be mistaken as descriptive of beauty, for there are many plain-looking horses excellent racers; but upon minute examination they will be found to possess that harmony of proportion which is essential to true action. Shape and make, is a subject of the utmost importance, and yet, in racing establishments, too frequently overlooked. "Like begets like," is a maxim which, although not infallible, ought not to be forgotten. It is more frequently applicable to defects than perfections. If the axiom could always be depended upon, breeding would be reduced to a certainty. By the union of a superior mare with a horse of equal merit, an equally good foal would be pro-

duced. As it is more frequently the case that hereditary imperfections and constitutional defects are entailed on the offspring than otherwise, too much circumspection cannot be observed in these particulars. If these subjects were more generally attended to than they are, less disappointment and loss would ensue; but if a mare be fashionably bred, no matter how ill-formed she may be, or has shown some running, as soon as her career on the turf is over, she is consigned to the harem. Beauty of proportion and appearance is a matter of still greater importance when it is the intention to breed hunters, hacks, or carriage horses, of which denomination twenty handsome ones, with showy action, are more readily sold than one whose merit consists in his goodness, without style and appearance to recommend him. Especially for the service of a stud farm, from which they must usually be sold before their qualities are put to the test, appearances are most essential desiderata.

Unfortunately many persons are sadly mistaken in the qualifications of animals, or the purposes for which they are calculated, and thus in making their selection of brood mares choose those for occupations which they are totally unfit for. In illustration of this, a short time since a young farmer, whom I met in the hunting-field, called my attention to a mare he was riding, inquiring at

the same time if I did not think she would be valuable as a brood mare. Looking her over I found her to be a thick, cloggy, vulgar animal, without the appearance of fashion, but having a great back and loins, her only recommendations. She had a short neck, with defective upright shoulders, round fleshy legs, small feet for her bulk, and little weak hocks: with such a frame it is scarcely necessary to add that she had no action. My inquiry was, what sort of foal he expected to obtain from her? he answered, "A "hunter. I shall send her to ——, mentioning the name of a horse that won the St. Leger a few years since. I do not introduce his name, having nô desire to injure the reputation of the animal, and consequently the profits of his owner, but I consider him to be the most perfect brute as a stallion imaginable. He is a great coarse, heavy animal, with long striding action, and as a hunter, in deep ground, would tire himself in a mile. Two such animals never ought to be united with any expectation of success. Put to an active cart stallion, or Yorkshire horse, the mare alluded to would no doubt breed something calculated for the vans in London, for which purpose horses of great size command a remunerative price.

The production of a happy medium by the union of two extremes, is scarcely, if ever, realised.

Persons sometimes fancy that by putting a huge, clumsy, cart mare to a thoroughbred stallion, they will have a produce with power and action; reasonably expecting to obtain some of the proportions of each parent. Imagine a creature with the head and body of the dam, the neck, shoulders, and legs of the sire, and a pretty specimen of the equine tribe it will be. But that is a common result of such attempts.

The racing success of the family to which a mare is related may be looked upon as a criterion worthy of attention, not only with reference to the parentage, but also in the brothers and sisters. There are numerous examples of mares showing very little superiority as racers themselves that have produced excellent stock; but then it will be generally discovered that their parents have distinguished themselves either on the turf or in the stud. The faculty of racing in such cases seems to have remained in abeyance, as it were, during a generation, manifesting itself also in some of the collateral branches. The age at which mares are put to the stud must depend upon circumstances; so long as their services, in their various employments, are valuable, few persons are willing to commence breeding from them. It has often proved the case, both with mares and stallions, that their best foals have not come forth till they became advanced in years; this,

however, more generally applies to stallions than mares. I am quite unable to state the cause, or even to assume the reason, neither have I ever met with any person who could do so satisfactorily. Racing mares often end their career on the turf at three years old, some even at two, and most when six or seven, at which latter period they may be considered most eligible for stud purposes. Many breeders appear to covet very young mares, but, from the observations which I have made, I have no reason to recommend them. It may sometimes occur with blood stock that cannot race, and are worthless for other purposes, that no occupation can be found for them, and thus they find their way into the stud; yet it is often more than questionable whether they are calculated for that, and if it would not be more prudent to consign them to the boiling house of the nearest kennel. Mares will continue to breed till five-and-twenty, sometimes till they are nearly or quite thirty years old, but as they approximate to that age their produce is generally smaller than during the more vigorous term of their lives.

The class of mares available for breeding hunters and hacks are not readily to be procured until they are at an advanced age. Persons do not like to part with those of a superior description till they have done their work, and none but good ones ought to be admitted. Who would be willing

to give up a clever hunter so long as she carried her owner safe and well?

To commence breeding with an old worn-out creature at the age of sixteen or seventeen years, cannot be sanctioned, the object being profit, by breeding fine, vigorous, and powerful animals. It is from such mistaken practices, conjoined with others quite as erroneous, that farmers have so frequently in disgust given up breeding as an unsuccessful employment, ostensibly in consequence of the very injudicious selections which they have made both of sires and dams. To obtain a good sort of mare it is far better to give a good price for one at six or seven years old, than to attempt the speculation with one whose infirmities render it very problematical whether her produce will be worth rearing. From a good sound young mare you may expect to have some ten or a dozen fine colts, which in due time may sell for one hundred sovereigns each; an infirm, aged, worn out animal, may favour you with foals which will not produce thirty pounds each. You have therefore a large margin for the contingent profit upon an additional outlay of twenty or thirty pounds for a brood mare.

Blind mares and stallions do not often produce blind foals, neither does it invariably follow that foals are roarers, because their progenitors were afflicted with that malady; yet these are defects

which should be most *suspiciously entertained*,—I use that expression advisedly, — because I would not reject the one or the other without most scrupulously investigating the cause, provided the animal was unexceptionable in other respects. Accidents, such as blows from inhuman savages, or bites from other horses, may deprive the unfortunate creature of eyesight. Such an event cannot be imagined by the most fanciful as tending to produce the like evil in the offspring. High feeding, bad stable management, especially when labouring under cold, and excessively violent exertion, may cause inflammation, which occasionally terminates in blindness. Those are not cases which need create apprehension. But cataract is another affair, having an hereditary tendency. Whenever constitutional blindness is to be traced through former generations, or collateral branches, the animal certainly ought not to be used for the procreation of its species.

We do not often hear of roaring in mares, and being the effect of inflammation it may not generally be characterised as hereditary, yet in some cases it would appear to be so, arising probably from a peculiar formation of the trachea, or windpipe, and in some cases from a peculiar susceptibility to inflammation of the mucous membrane, with which it is lined; thus it may be fairly termed an hereditary defect in a modified degree.

Spavins and curbs being on most occasions results proceeding from a peculiarity of form in the hock, may truly be denominated hereditary defects: they certainly ought to be rejected on all occasions. More attention has undoubtedly been paid to this subject of late years, for there are evidently not so many horses affected with them as were to be seen some five and twenty years ago.

CHAP. III.

BARREN AND OTHER MARES.

Importance of Quietude. — Mares to Stallion. — Slipping Foals, frequent Causes thereof. — Prevention of Evils. — Arrangement of Mares without Foals.

HAVING fully discussed in another chapter the period of the year most eligible for foals to be brought forth, it is only necessary in this place to offer a few remarks upon the attainment of that object. I will pass over the minutiæ of trying, and the subsequent event, as subjects so thoroughly understood as not to require any detailed instruction, but after a mare has left the stallion it is of the utmost importance that she be kept free from all excitement. With mares that have never had foals more attention is required than with those which have foals at their sides. Similar caution is also necessary with mares that have missed a year.

It is usually the practice to present mares to the horse nine days after they have foaled. They are generally in a proper condition at that time, and there is no doubt as to its being the period most likely to ensure a renewal of that state so

earnestly desired. At the expiration of a fortnight the trial is repeated, and again at the conclusion of another similar period, when if she refuses, the event is generally considered to be conclusive, providing she has not during any interval evinced unfavourable symptoms. The custom of constantly harassing mares with the amorous dalliance of the stallion cannot be too strongly deprecated. Many are of such a temperament, that if so treated, they are almost certain not to prove in foal.

When a mare foals early in January, she cannot, as a matter of course, be permitted to receive the addresses of the stallion till the succeeding month, or there will be some danger of her presenting her owner with "an addition to the establishment" at the conclusion of the old year, by no means so acceptable an offering as a "New Year's gift." Neither is it advisable, under any circumstances, to run the time too near by sending mares to the horse early in February; as it sometimes happens mares do not go their full period, and thus by spinning the calculation too fine much disappointment may ensue.

If a mare slips her foal, it is sometimes the result of want of precaution, at others of an inherent propensity, which no attention seems capable of averting. When once it has occurred, it is very likely to happen again. The stench from carrion

is peculiarly offensive to mares during the period of gestation, and should therefore be most scrupulously kept away from them, as well as every other bad smell, not omitting the disagreeable odour of gas tar, a production sometimes used to preserve gates, posts and rails, palings, and other kinds of wood work; hence it should never be employed about any premises where mares are kept. The fumes which arise from putrid vegetable matters are also exceedingly objectionable.

The leaves of the savin tree being known to occasion abortion should be carefully excluded from the precincts of a stud farm. The willow, if consumed in large quantities, will produce a similar effect. Such trees, therefore, should never be permitted to flourish within reach of brood mares; when in foal they have sometimes a morbid appetite for all descriptions of rubbish, for which reason it is better not to allow any trees to grow within their reach. All exciting events should be carefully avoided, especially the neighing of stallions; and those mares which may possess a habit of galloping about will be most safe in small enclosures by themselves; few, however, have this propensity when in foal, and it may be deemed an evidence against their being in that state; but, under any circumstances, the restlessness of an individual should not be permitted to disturb the tranquillity of others.

It may appear that I have been adducing precautions as to casualties which very seldom happen. But it is to be remembered that they relate to subjects over which the proprietor of a stud can exercise his control and discretion. On all occasions "prevention is better than cure," and in nothing is that axiom more applicable than in the management of a stud of horses. I remember some years since visiting a friend who was an extensive breeder. He exclaimed loudly against his ill luck, complaining that his stock was frequently subject to injuries, being lamed from kicking each other, and all sorts of disasters. Upon inspecting the premises, most of these mishaps were readily accounted for. The palings which were *intended* to divide the paddocks were in a very dilapidated condition, absolutely down in places, with pieces of wood lying on the ground, wherein were rusty nails sticking upwards. The entire colts were running about without restraint, and, consequently, inflicting injuries on each other,—one of them was then suffering from a blow or bite on the eye; and my friend ran through a long list of unfortunate events, most of which were traceable to want of precaution. Such cases must not be attributed to bad luck.

Horses are social animals, and with the exception of entire colts, may in general be permitted to enjoy each other's company during

certain portions of the day in the paddocks or yards appropriated to their use. There may be, however, some exceptions among brood mares, which are very soon recognised, and in that case the malicious animal must be sentenced to a life of solitude. To assign, however, separate departments to barren mares, mares in foal, and mares with foal, will generally be advisable; where there are conveniences, it is certainly safer to allow separate paddocks, or yards, for the accommodation of such mares as have foals by their sides.

During the winter season, three hours' enlargement in the paddocks, or yards, is quite sufficient for barren mares, or any others; in the summer, there is no objection to their remaining out the greater portion of the day, being, of course, supplied with food during that period; nevertheless, if the weather be very hot, and flies troublesome, they will be better in some sheltered building, except early in the morning, or in the afternoon when the atmosphere is cooler. In fact, if the weather be very hot, it is a plan far preferable to keep them in during the day, and enlarge them at night.

CHAP. IV.

STALLIONS.

Demand for Thoroughbred Stock. — Descendants of Penelope. — Changing Sires. — The Quagga and Arab Mare. — Colour. — Choice of Stallions for particular Mares. — Improvements must be acquired by Degrees. — Superiority of the English Horse. — Their Size. — Anatomical Proportions. — Inconsistency of Breeding from very Large Sires and Small Mares, and *vice versâ*. — True Symmetry most frequent in Animals of moderate Size. — Standard of Excellence. — Effects of Food. — Comparative Texture of Bone in the Thoroughbred and Cart-Horse. — Effects of Training and Racing. — Hero and his Pedigree. — Hereditary Properties. — Curious Incidents connected with celebrated Stallions. — General Opinions of Breeders. — Extremes deprecated. — The most likely Means of breeding Valuable Stock. — Hereditary Defects. — The Opinion of a Veterinary Surgeon thereon. — Exercise for Stallions. — Hocks. — Shape and Make. — Bay Middleton. — Sir Hercules. — Touchstone. — Their Pedigrees compared. — Breeding In and In. — Arabian Blood not advisable for racing, but admissible for Hacks. — Horses are acclimatised. — Breeding Hunters and Road-horses especially considered. — The Distinction of the Term Thoroughbred. — Erroneous Data. — Apartments for Stallions. — General Characteristics.

So great has been the desire manifested by foreigners to become possessed of our best thoroughbred stock, that whenever a horse has evinced great superiority either on the course or in the

stud, he has generally been sought after, and often obtained at a very great price. This, whilst it offers an inducement to Englishmen to breed race horses, is a temptation which has frequently deprived them of the services of very superior animals in the stud, and cannot be regarded otherwise than as a loss. Nevertheless, there are so many horses bred annually in this kingdom, that it would be a marvellous event, indeed, if there were not a sufficient number left to enable the most fastidious to make an election suitable to their taste and the blood of their mares.

It is a remarkable fact, and somewhat worthy the attention of breeders, that the most successful stallions of late years are descended in a direct line from one mare, the Duke of Grafton's Penelope; the most celebrated of which are Defence (dead), Bay Middleton, Sir Hercules, and Touchstone. The first seven of her produce were all by one sire, Waxy. Including a filly, which was not named and put to the stud, she produced Whalebone, Web, Woful, Wilful, Wire, and Whisker; all first-rate animals, Whalebone and Whisker not only being winners of the Derby in their respective years, but likewise the sires of many very superior horses. After having bred Whisker, Penelope was put to Walton, the produce being Waterloo, an animal of moderate pretensions. Wildfire and Windfall followed, and were the off-

spring of her first partner Waxy; she then gave birth to Whizzgig by Rubens, Waltz by Election, and Wamba by Merlin, the last three of which were very moderate indeed compared with the first seven of Waxy's progeny. Can this manifest inferiority have arisen in consequence of changing the sire? if so, how much more desirable it would be to continue the same stallion on all practicable occasions, rather than seek a fresh one every succeeding year, a practice adopted by many breeders. There are many secrets in Nature which we cannot comprehend, and this may be one of them.

An old and valued friend, a few years since "gathered to his fathers," who was an extensive breeder, and moreover a very keen observer, was wont to be very earnest in his declaration, that mares should never be sent but to the same stallion during the whole course of their career in the stud, unless it could not possibly be avoided. I certainly am not prepared with any argument to oppose his opinion, although it was undoubtedly founded upon very subtle notions of the works of Nature. He maintained that a mare having bred foals by different horses entertained a greater predilection for one partner than another, and that on subsequent occasions, having reminiscences of past events, the produce was affected thereby. Horses certainly possess the faculty of remembrance to a much greater extent than casual observers are apt to give them credit for, and this

may be an event capable of creating a more lasting impression than any other.

My friend has often related to me the circumstance of an Arabian mare which was barren several seasons, and in order to cause her to breed, the experiment was tried of putting her to a quagga: this was so far successful, and she brought forth a mule. On subsequent occasions the best bred horses were put to her, by whom she had foals, but they were all marked with a stripe down the back similar to quaggas and mules, each foal having it more faintly delineated than its predecessor. This circumstance certainly bears evidence that there is some affinity between the produce of different sires more than can be substantially accounted for. Horses are sometimes seen with this stripe, but I have never had an opportunity of ascertaining if they, or their ancestors, had ever had communication with a quagga.

The fastidious in colour may be anxious to attempt to regulate that phenomenon; to what extent they may be able to do it, is not easily defined. Some horses are notorious for getting foals of particular colours, not always identical with their own; but it generally happens in such cases, if the circumstance be investigated, that the colour which predominates in the stock is traceable to some ancestor of the sire or dam, such is the predisposition of Nature to go back to the original.

It may consequently be received as an hereditary quality, and with thoroughbred horses is readily traced in the stud-book. The old adage "that a good horse is never of a bad colour," does not invariably apply; it depends upon the purpose for which the animal is required. If to race only, the maxim is in force; but in the event of the produce being intended for sale, it becomes quite another affair, especially in the esteem of foreigners, who have an incorrigible antipathy to white legs and white faces, why—it is difficult to explain; but as no argument will induce them to change their opinion, it would be futile to attempt it. Greys are much out of fashion; there has not been one possessing a first-rate reputation on the turf for many years; and although it is a prevailing colour with Arabs, those foreign horses which were the first progenitors of our most celebrated blood-stock were principally bays and chesnuts. The Godolphin Arabian is described as a brown bay. The Curwen Barb was also a bay. Eclipse, a grandson of the first-named horse, was a chesnut. In the early records of breeding studs many greys and chesnuts prevail, but at the present period bays and browns predominate—in all probability the effect of climate, inasmuch as few if any racing men have ever observed any preference as to colour,—a subject more interesting to those who breed for sale.

Where only one or two stallions are kept for

the service of the establishment, it not unfrequently happens that a great error is fallen into by putting mares to one which, from a variety of circumstances, may not be suitable. It may be done under the impression of saving expense, but there are many instances in which it is the worst economy. The choice of a stallion for each mare, instead of being left to chance, requires to be guided by the greatest experience, judgment, and study. With the hope of correcting in the progeny whatever defects or imperfections prevail in the mare, the most judicious course to pursue is obviously that of seeking the remedy in a stallion most perfect in those points in which the female is defective. There is, however, one circumstance connected with this practice, which demands especial notice in these pages. It is that of endeavouring to compensate, by the great size of the horse, the deficiency in that respect of a mare; one of the greatest fallacies, both in theory and practice, that can possibly be entertained. When dealing with the handiwork of Nature, man must be content to obtain the objects of his wishes or improvements by degrees; a limit is opposed to the progress of human ambition, and the man, who, in the hope of ascending to the summit, on which his ambitious dream of perfection hovers, by one gigantic step, most frequently finds himself hurled to an immeasurable distance from the attainment of his wishes; whereas, had he been

contented to woo Nature more diffidently, he might in due time have attained his object.

The superiority which the English race horses possess over Arabians, or horses of any other nations, is manifestly derived from their greater size, increased length of stride, and the just proportion of their limbs. The animals from whence they were derived some two centuries ago, and subsequently for many years, were not larger than the ordinary Arabs or foreign horses of the present day. The increase of size has evidently been the result of food, climate, and the selection of large and muscular animals for the procreation of the species. Marske, the sire of Eclipse, was only fifteen hands high, and it appears very evident the horses of those days did not in general exceed that height. Unless the anatomical proportions of a horse are uniform, superiority cannot exist. Action must be obtained by a combination of powers and conformity in those limbs from which motion proceeds, in order to attain speed, and the faculty of endurance. Many of these parts are so completely hidden from the eye, that it is quite impossible to judge of a horse's merits till he is tried. It is generally expected, and usually realised, that the offspring partakes some of the features of the sire and some of the dam; therefore, if a very large horse be put to a small mare in the expectation of their producing a large foal, and that foal takes after its sire in the fore-

quarters, and its dam in the hinder ones, the exactness of anatomical proportions and symmetry must be lost, and the offspring will be comparatively worthless. Another very striking consideration presents itself, in the danger to which the mare is exposed at the period of giving birth to the foal. In case of mares being under-sized, but otherwise combining the important faculties of blood, soundness of constitution, symmetry, and temper, to justify their admission into the stud,—and there are many that come under this description,—it is far more advisable to endeavour to seek a remedy in good keep, and a medium-sized stallion, than by any attempt of forcing nature, by the presentation of an over-sized partner. For racing purposes I cannot advocate over-sized horses. Immensely large ones have, on all occasions, disappointed the hopes of their owners; they have neither realised great superiority on the turf or in the stud. It is evidently much more difficult to obtain true symmetry in over-sized than moderately-sized animals.

If a man could succeed in breeding an enormously large horse with very exact proportions, he would no doubt obtain a prize; but the chances against his doing that are enormous, and too great to justify the attempt.

There is a standard of excellence which regulates the stature of all animals: that exceeded or not attained, the acme of perfection must be wanting. It is to a certain extent under the dominion

of food and climate. The usual standard of the Arab is from fourteen to fifteen hands; that of the English race horse of the present day is from fifteen to sixteen hands. The cart or dray horse acquires a growth exceeding seventeen hands, but he rejoices in a very different kind of food to that which is destined to produce the firm texture of bone and muscle, the essential attributes of blood stock.

"Certain causes produce certain effects," and it would be just as reasonable to suppose a man could breed race horses on the luxuriant herbage of the fenny districts and marshes, as that he could breed cart horses in the deserts of Arabia. The former would become loaded with flesh, the latter would melt away from the effects of the atmosphere, and starve from the scantiness of pasture. The difference in the texture of the bone of the thoroughbred horse and the cart horse is most extraordinary. Any one who will take the trouble to examine the cannon bone of the two varieties, will instantly detect the difference. That of the former is much harder, and more compact, and although smaller in circumference, when weighed against an equivalent length of the latter, will be found to be the heavier of the two. The bone of the cart horse is by far more porous, confirming the assertion, that a greater amount of power is concentrated in a given bulk of the

blood horse, than in a similar proportion of the cart horse.

A long continuance of a horse's services in training and racing, has on many occasions entailed a prejudicial effect when he has been consigned to the stud; indeed, few horses so treated have ever become very celebrated in the latter department. A horse or mare that has run a few races, only just sufficient to ascertain the respective goodness of each, their temper and soundness, are by far the most desirable for the purpose of procreating their species. We sometimes, though rarely, have instances where a horse of no repute, and a mare of mean pretensions, produce a wonderful animal. In modern days we have an example in Hero, worthy of minute investigation, to show how blood may come to the rescue. His appearance may be thus described, — his head is lean but by no means handsome, shoulders good, legs sufficiently so to pass muster, feet middling, body good, back ribs short, wide hips with plain quarters, by no means improved in appearance by a low set tail. The length from his hip to his hock fully corresponds with his shoulders, which may be considered a very essential point. His pedigree is as follows: — By Chesterfield, out of Grace Darling by Defence, her dam by Don Cossack out of Mistake by Waxy. By way of example it will be desirable to analyse this blood more minutely.

The Male Line.	*The Female Line.*
Chesterfield was by Priam out of Octaviana (the dam of Crucifix), by Octavian; her dam by Shuttle out of Zara, by Delpini—Flora by King Fergus.	Defence was by Whalebone, out of Defiance by Rubens; dam, Little Folly by Highland Fling—Harriet by Volunteer.
Priam by Emilius out of Cressida, by Whiskey; her dam, Young Giantess, by Diomed—Giantess by Matchem—Emilius by Orville, out of Emily by Stamford; her dam by Whiskey out of Grey Dorimant, by Dorimant.	Don Cossack by Haphazard out of Alderney by Skyscraper; her dam, Celia, by Volunteer out of Sister to Pharamond by Highflyer.
Orville by Beningborough, out of Evelina by Highflyer.	Mistake by Waxy out of Woodcot by Mentor—Rubens by Buzzard, dam by Alexander, grandam by Highflyer.

Thus it will be seen he is descended from Penelope on both sides,—that is, through Whiskey and Whalebone, and in like manner from Highflyer. There are two strains of Whiskey in the male line, one in the female. One strain of Highflyer in the male line, and two in the female.

Octaviana was nineteen years old when she produced Chesterfield, and twenty-one when she produced Crucifix. She bred thirteen foals previously, none of which were first-rate either on the turf or in the stud.

Cressida produced nothing good except Priam.

Emily bred nothing worthy of notice except Emilius. He was a good race horse and a good stallion; and so was his sire Orville.

As a racer, the performances of Defiance were very moderate,, but she produced some good colts, Dauntless, Dangerous (winner of the Derby), and Defence. It may be inferred from this, that the superiority of Hero is derived from the male progenitors, both in his paternal and maternal line; but more conspicuously in the former, where we find Priam, Emilius, Orville, and Beningborough; in the latter, Defence, Whalebone, and Rubens.

Of Chesterfield's performances, nothing can be said in his praise; he received a forfeit in a produce stake at Newmarket, when in the possession of the noble Lord who bred him, and whose name he bore, after which he retired into South Wales, where he ran but once, and was beaten at Aberystwith by a very inferior filly, the property of Mr. Pryse Pryse.

In the stud he was even more obscure, never having the honour of an offspring to enrol his name as a sire in the Racing Calendar, till Hero made his appearance; but Chesterfield dying before the colt came into notoriety, he alone remains to perpetuate his race. The pretensions of Grace Darling to racing fame are very moderate; she ran many times, but only won four races, beating inferior animals.

It is a matter of opinion whether the offspring partakes most of the faculties and properties of the sire or dam. They no doubt participate in both, though from which they shall derive the greater amount of perfections it is difficult to determine.

In some instances it may be observed that all the produce of certain mares partake of her peculiarities, while, on the other hand, some mares will throw foals whose characteristics follow their sire. And on some occasions peculiarities are traceable to grandsires, grandams, or even more remote kindred. These are subjects which demand attention. The breeder who devotes most skill in the selection of suitable animals to breed from, will assuredly be more successful than one who leaves all to chance.

There are some curious incidents connected with the history of other celebrated sires, which bear some analogy with that of Chesterfield. The Godolphin Arabian is said to have been purchased in Paris, where he had been drawing a cart. He was brought to England, and placed in the stud of Lord Godolphin, where he became the sire of Lath, a superior horse of his day; this brought the Arabian into repute, and he bears the honour of being the founder of the best strain of blood we possess. Squirt, the sire of Marske, was condemned to be shot, and when on the road to the

kennel to meet his fate, a reprieve was granted at the intercession of the groom. He subsequently became the sire of Marske. The last-named horse was sold at Tattersall's, after the death of His Royal Highness the Duke of Cumberland, for a mere trifle to a farmer, who sold him again for twenty guineas. The Earl of Abingdon eventually became a purchaser at one thousand guineas, the horse's renown being established by the performances of Eclipse, of whom Marske was the sire. Had Chesterfield survived the glories of his son, there is every reason to suppose he would have risen from his obscurity, and become one of the most fashionable horses of the day.

Many breeders are of opinion that the principle to be adopted, in order to obtain a first-rate colt, is that of sending a mare whose running has been characterised by stoutness, to a horse famed for speed: whether it can be laid down as an established rule is, perhaps, questionable; but it is certainly desirable to breed from mares enjoying stout and healthy constitutions. If the relative symmetry of the sire and dam were more generally observed, it would no doubt be attended with success. It has already been suggested, that the most judicious course to pursue is that of seeking the remedy in a stallion for the defects which exist in the female. It is again necessary to refer to that subject as one which must be qualified in

its extent, for all extremes are bad. I am not aware of a single example of a very lengthy mare producing a good foal by a very short compact horse. Spectre was in some respects of that description, and none of his stock could race. Here let me remark, I am confining my observations to blood stock only; for racing purposes a short animal is by no means desirable. The defects which may be obviated in one sex by the converse in the other, are legs and feet, shoulders, backs, loins, and hocks, but a great disparity of proportions cannot reasonably be expected as conducive to symmetry in the progeny. There can be no doubt but the most likely means of breeding colts that will command a high price when offered for sale is accomplished by putting mares to stallions of high repute as stud horses; for, as with mares, it does not follow that an untried stud-horse must become the progenitor of a succession of first-rate foals, because he happens to have been a good runner himself; and again, instances are not wanting of horses that never evinced even moderate pretensions as racers, that have been very successful in the stud. This is a matter which no man can foretell; it must be determined by experiments.

To expatiate largely upon the question of hereditary defects in stallions may be, in some degree, a loss of time; not that they should be thought

lightly of — quite the reverse; but there are so many persons who entertain different opinions respecting them, and who appear to be provided with "ready made" excuses on the instant any defect is mentioned to them of a pet stallion—one they may have set their minds upon, and who, in the warmth of their imagination, must be their lucky star, that it seems almost a hopeless endeavour to convince them. One horse is objected to because he is a roarer, when his partisan will apologise for the malady, under the supposition that it was the effect of a severe attack of influenza. Another horse has curby hocks; for which an excuse is urged, that his fore legs and feet are so very good. In a conversation lately with a veterinary surgeon, whose experience in such matters is certainly not surpassed by any of the profession, I was in some measure startled by his declaration, that all stallions, when put to the stud, became roarers. He enumerated a great many, several of which, I am bound to admit, were to all appearance so afflicted; and I am not in a position to gainsay the truth of his assertion as regards others, for many horses so employed might be roarers without the knowledge even of their owners, their exertions not being of a nature calculated to exhibit the symptoms, unless a very careful examination were made. At the same time it must be observed, that a horse not having

any exercise, and very fat, will frequently manifest symptoms of roaring, and so palpably, that good judges would possibly pronounce him so affected, while, in fact, it is nothing but the result of plethora, which, being removed, the supposed malady will disappear. I have known several instances of this kind in hunters; hence, I am induced to suppose that many stallions when loaded with fat may give indications of being roarers without actually being so. Admitting that it may be the case, it certainly, in such instances, proceeds from want of exercise and over-abundance of fat. I had two horses which I rode with hounds, one four seasons, the other two. They were used in the stud during that time, and their pipes were as clear as possible. This much must be held in remembrance, — that certain horses are very apt to entail the malady on their progeny.

When once consigned to the stud, stallions very seldom enjoy any exercise beyond that which they can obtain in the box and the yard adjoining; thus they become an accumulation of fat, and so unruly that it is scarcely possible to manage them. That it would be more conducive to their health if they were led out every day, there can be no question. On this account, travelling stallions have greatly the advantage over those attached to a stud, the aristocracy of which forbids their

rambling, and, as it would appear also, the indulgence of salutary exercise.

We now come to a very perplexing theorem, and a most important consideration — the fore legs. Unless they will bear work, the animal is doubtless of no value, either on the turf or for any other purpose; but yet many of the very best race horses have had dreadfully bad fore legs, a failing which has, in many cases, been entailed on them by their ancestors. In very clever hands, horses with bad fore legs are often able to get over some great event; and their services on the turf being expended, they still continue to be profitable investments when consigned to the stud. As there are some few horses nearly, if not quite, free from infirmities likely to be entailed on their progeny, it would surely be most prudent to select them rather than encounter the great probability of disappointment. Hocks evincing any predisposition to curbs and spavins, must on all occasions be looked upon with the greatest suspicion.

To describe precisely the shape and make of a horse calculated to become the progenitor of first-rate racing stock is not readily done on paper; those of the most opposite character having been pre-eminently successful — Bay Middleton and Sir Hercules, for example. The former, a very lengthy horse, especially about his shoulders and

hind quarters; high on his legs, with vast propelling powers in his thighs; wide, if not rather inclined to be ragged, about his hips, with drooping quarters. Sir Hercules, much lower in stature, on short and good legs, with the most symmetrically beautiful quarters, with as well-turned hips placed forward as I can remember on any horse; his hind legs in the exact position calculated when in action to enable him to get them well under his body. Touchstone may be described as a medium between the two, and I can scarcely imagine a more perfectly proportioned animal. There is a vast deal of the same blood flowing through the veins of each of these stallions, which will be found on perusal of their respective pedigrees: —

Bay Middleton is by Sultan, his dam, Cobweb, by Phantom out of Fillagree, by Soothsayer, her dam, Web (sister to Whalebone) by Waxy.—Penelope. Sultan by Selim out of Bacchante by Williamson's Ditto, by Walton. Selim was by Buzzard out of an Alexander mare. Walton, sire of Williamson's Ditto by Sir Peter. Phantom was also by Walton. Soothsayer by Sorcerer, out of Golden Locks by Delpini.

Sir Hercules is by Whalebone out of Peri, by Wanderer, her dam, Thalestris, by Alexander out of Rival by Sir Peter; and Wanderer by Gohanna out of Catherine by Woodpecker, the sire of Buzzard. Alexander was by Eclipse.

Touchstone is by Camel out of Banter by Master Henry, her dam, Boadicea, by Alexander out of Brunette, by Ama-

ranthus. Camel was by Whalebone, dam by Selim, out of Maiden by Sir Peter. Whalebone by Waxy out of Penelope.

Thus it will be seen that each of the three are lineally descended from Penelope; that the Sir Peter and Alexander blood flows in each of their veins, and the Buzzard blood in both Bay Middleton and Touchstone, while Catherine, the great grand dam of Sir Hercules, being by Woodpecker, the sire of Buzzard, the same strain is distinguishable through several generations.

Consanguinity, or as it is technically expressed, breeding "in and in," has its advocates; but near relationships cannot be reconciled with propriety. After an interval of two or three generations it does not appear to be objectionable; but a more close alliance cannot be recommended. In the early ages of racing it was resorted to in many instances, but there was not the diversity of blood which we now possess, and the argument then used, that it was better to breed from those nearly related, provided the blood was good, than resort to that which was inferior, for the purpose of avoiding consanguinity, is not applicable at the present period. In illustration of this it may be observed, that Rachel, the dam of the celebrated High-Flyer, was bred incestuously. She was by Blank, her dam by Regulus, both of which horses were by the Godolphin Arabian. This example,

although it serves to show how far it succeeded under peculiar circumstances, is not introduced as a recommendation to be followed up even as an experiment when there is so much excellent blood available which is not so closely related.

The idea of introducing Arabian blood into the stud for racing purposes would, I feel assured, be treated by every practical and experienced breeder with contempt; and I only venture to mention the subject in order to point out some of the most ostensible reasons why the attempt would be followed with disappointment. In the first place, the breed of race horses in this kingdom is far superior to the Arabians or other foreign horses brought to England at the present period. The casuist may remark, that our blood was originally derived from those sources. The reply to which is obvious. They have taken kindly to the soil, the climate, and the treatment; hence the present breed of horses is superior. For riding horses, however, it is quite another affair, as the Arabian will give that style of action so universally sought after, and the produce of an Arabian with a really good shaped mare possessing sufficient bone, not too large, with moderate length and width, is as likely to realise a remunerative price in London as almost any other kind of horse. The only objection that I am aware of is, the fact of these foreign horses not being naturalised to this cli-

mate; for practical and observant breeders are aware, with cattle and sheep, that those thrive best which have been for a series of generations located in the same district. This is, no doubt, applicable to the equine tribe, and hence another reason why a cross with the Arabian is unsuccessful for racing.

In breeding hunters or carriage horses the selection of stallions may be less important than for the turf; at all events, different qualities are required. Symmetry is of far greater consequence than blood, good sound legs and feet, than speed, lofty action more to be coveted than length of stride; colour and temper also comes under the category of desiderata. When the fashion prevailed of running half-bred horses, it was discovered that those were most superior which had the stain on the mare's side,—in other words, that the sire should be thoroughbred; the same principle holds good with hunters, for at the pace they are now required to go, every event calculated to furnish them with endurance must be resorted to in order to render them valuable; and as the worth of a horse is enhanced if he shows properties adapted for steeple-chasing, that must be another motive for attention to such qualifications.

The question what constitutes the title to the term thoroughbred, as applied to the horse, can

only be answered to this effect. He is one whose genealogy can be traced in the Stud Book, or whose sire or dam is an accredited Arabian or horse of Eastern origin, represented as being of the pure blood of the country from whence he was imported. Any attempt to dive into the mysteries in which the origin of the thoroughbred horse is enveloped would be superfluous. The errors as to data or periods when certain horses are stated by some ancient authors to have existed, are so numerous as to leave the reader in much perplexity. Writers of a later date have endeavoured to explain these discrepancies, in doing which they have fallen into mistakes calculated to increase the confusion. One example, which I lately saw in print, may suffice as an illustration. "Vixen, by the Helmesley Turk, out of Dodsworth's dam, a barb imported in the time of Charles II.," some time between the years 1660 and 1685, is stated, in the publication alluded to, to be the dam of the celebrated Careless. The Stud Book informs us that Careless was foaled in 1751, a period comprising from ninety-one to sixty-six years after the above date. Careless was by Regulus, who was foaled in 1739, out of Silvertail by Whitenose, her dam by Rattle, out of the Old Child mare. The Old Child mare by Sir T. Gresley's Arabian, out of *Vixen*. Therefore Vixen was the *great great* grand dam of Careless.

As lord of his species, the stallion has generally assigned to his use a most capacious dwelling — a box of large dimensions; but provided he has a strongly fenced paddock of ample size, there appears no absolute necessity for his box being much if any larger than those occupied by mares. Brick and mortar is unquestionably the most secure fence. The doors, mangers, and all such like fittings, should be of the most substantial form and material, every part of which available to his teeth should be well secured with iron. Idleness, the parent of mischief with the horse as with the human species, is almost certain to engender a habit of some kind; and to while away the time, nibbling the manger will very probably terminate in crib-biting, unless the propensity is met by a salutary opposition. The domicile of the stallions should, on many accounts, be so situated as to be at a distance from the buildings and paddocks occupied by the mares, otherwise the excitement may occasion inconvenience to both sexes.

Whether for racing, or for other purposes, a stallion should possess a faultless pedigree, and his good looks should bear the stamp of "title" in his ancestors and in himself; power and action are qualifications which should never be overlooked, and, as a test of soundness and constitution, a horse that has finished his racing career without failing in his limbs is undoubtedly to be preferred.

CHAP. V.

TREATMENT OF MARES IN FOAL AND WITH FOAL.

Period of Foaling.—Beneficial Effects of Warm Weather. — Spring Grass.—Evil Effects of Catarrhal Affections. — Late Foals. — Preparations for Mares about to Foal. — Litter. — Water.— Anecdote.—Term of Gestation.—Attentions at the Time of Foaling. — Indications. — Assistance.— The Foal.— Treatment of Mare and Foal. — Precaution against Wet. — The State of the Bowels.—Lard, as a Laxative.—Relaxation of the Bowels—Cause thereof.—Corn to Foals. — Worms, Remedies against.—Foals' Feet—require Moisture during Dry Seasons. — Handling the Feet of Foals. — Tar Ointment. — Weaning, and preparatory Management.—Secure Apartments imperative.— Objection to putting two Foals in one Place. — Examination of Mares.

THE period when mares are to foal, and the management calculated to regulate that event at the most seasonable time of the year, demand considerable attention. Very important objections present themselves against foals being brought forth too early in the year, powerfully counteracting the advantages which may be anticipated from a few weeks' superiority in point of age, with such as are destined for the turf; with those of any other class, I presume there can be but one opinion on the subject, and that the months of March, April, and May, would be considered the most favourable periods. In this cold and variable climate, a foal that comes into life in January

has usually an inclement temperature to contend against, in all probability during several weeks, which no artificial means can obviate, during that month and the succeeding one. Very frequently also in March there is not one day when the atmosphere is sufficiently warm to sanction a mare and her delicate foal being released from their box; they must, therefore, be housed till the weather is propitious. For the purpose of supplying a copious flow of milk, no other kind of food is comparable with the green herbage of spring; not that I am about to propose the indiscriminate use of it to excess, unaccompanied with corn and, on many occasions, a portion of hay; but a certain quantity is almost essential to the secretion of milk in ample quantities. The fine warm genial weather conducive to the production of food calculated to promote the growth and strength of foals seldom visits this country till the month of April: there are no artificial substances that we can select equivalent to the bounteous herbage which Nature provides at this season. All, therefore, that can be offered previously to the appearance of the spring grass, for the support of a mare and her precocious offspring, must be regarded only as a succedaneum, capable of sustaining life, but not of a quality adapted by its suitable properties to give the young animal that start on its first introduction to this world most essential to its future welfare. When these delicate creatures sustain a

check to their growth at so early an age, much time and care is required to overcome the evil; and sometimes the effect is so great on the constitution, that they never attain vigorous health and powerful development. It frequently happens that a yearling evinces debility, weakness, unthriftiness, weediness, and various ailments, although the sire and dam, and their other family in general, may be robust and promising. No apparent cause may indicate the reason why the yearling should not prosper; yet, in all probability, a careful investigation of past events would trace the infirmity to some ostensible cause, such as a cold or a check to the young animal's growth, resulting from want of appropriate food. To obviate these misadventures, much circumspection is requisite in the management of a stud.

Under all circumstances, the months of March and April, extending the term from the last week in February to the first week in May, is the most favourable period for mares to drop their foals; they will also bring forth in the ensuing season during a desirable time, and the young creatures will enjoy, when it is most acceptable to them, the invigorating influence of the sun's genial rays, of no slight importance to their health. No one can have watched the progress which a weakly foal makes during a few days of sunshine, in April or May, without admitting this fact.

There are, nevertheless, still greater objections

to foals being produced very late in the summer, as they have not time to gain strength ere winter sets in. The autumn is also an unfavourable season for the equine tribe, for they then change their coats, during which event good nourishing keep and warmth are of vast importance. Besides all this, a thoroughbred foal intended to run at two years old, if foaled late has manifestly a disadvantage to contend against when opposed to others having some months' superiority of age. The intermediate period is unquestionably to be preferred; the beneficial results that might be anticipated from two months' additional growth are more than counterbalanced by the effects of an inclement atmosphere, and the want of suitable food for the dam.

Where convenient places are provided for mares to foal in, no preparations are necessary beyond having them in readiness; but if such buildings are not at command, the box or hovel which the mare occupies, if sufficiently spacious, may suffice; otherwise a bay in a spare barn is on all occasions a suitable lying-in hospital, providing it is made secure from currents of air or draughts, which, in most cases, may be readily done. A place so sheltered, roomy, and well ventilated, is generally available in country places for the short time it can be required for this purpose; and when the ceremony is over, the mare and her produce, if the place is wanted for the accommodation of

others, may be removed to her usual habitation, should that have been considered not sufficiently roomy for the occasion. Whatever place may be selected for a mare to foal in, it should be properly protected with dry litter, so as to present a nice level and soft surface, not too thick; but, just at the time a mare is expected to drop her foal, it should never, on any account, be replenished with new straw, which mares are very apt to devour greedily, and thereby distend themselves to a dangerous extent. A sort of morbid appetite for food and water frequently prevails at this crisis, which dictates that caution should be observed in keeping those things away from them which are calculated to do them harm. Should it be necessary to replenish the litter, it is better to take a portion of some that is sufficiently dry and clean from other horses, to whom new straw, with which their complement is made up, cannot be productive of injury. The circumstance above mentioned points out the propriety of giving food as well as water in small quantities to mares when they are expected to foal. Water should be supplied in moderation three times a day. Having fresh on my memory a fatal event which occurred in a breeding stud in consequence of this oversight, I cannot do better than state the circumstance: — It was the custom to allow the mares to run out of their boxes night and morning to

water at a pond, to drink *ad libitum*. A mare drank to excess; in a short time afterwards she was taken in labour, and to all appearance gave birth to her foal very favourably; but immediately after it was evident she was in great pain; and in less than an hour she was dead. On opening her, it was discovered she had ruptured one of the intestines, which were much distended with food.

The time when a mare ought to foal being punctually registered, will afford some indication when the event may take place; but that must not be relied upon as an infallible criterion — some mares will foal before, others will go beyond their time. The same mares will vary in the term of gestation in different years. It is a prevailing opinion that mares go longer with colt than filly foals, but that does not always prove correct. I had a mare that invariably went from twelve to sixteen days after her time; she bred eight foals, all of which were fillies. At least a fortnight before a mare is expected to foal preparations should be made, and every requisite kept in readiness. She should undergo frequent examinations; and as the time approaches, a visit every second hour ought to be made, not omitting such attention two or three times during the night. Mares may not require any immediate assistance — nine times out of ten they will not — but yet it may

happen that timely attention will save the life of a valuable mare and her produce.

The appearance of a waxy substance on the teats is one of the indications by which the approaching time for foaling is generally recognised. Many mares will evince that symptom a fortnight or more beforehand, and others will scarcely afford any such notice; sometimes it will appear profuse and nearly disappear again. The most unequivocal criterion is the sinking or dilation of the muscles on each side of the root of the tail, occasioned by the expansion of the joints, an effort of Nature to render more easy the act of parturition.

Want of attention and watchfulness at this particular crisis has been the cause of many a valuable foal being lost or injured in its birth. When a foal presents itself in an unfavourable position, assistance should be promptly obtained from some person who has had experience in such cases. It seldom happens that grooms or attendants are engaged to take charge of large and valuable studs who have not acquired some knowledge of this portion of their duty; but in small establishments, which may not be so provided for, recourse must be immediately had to the assistance of a competent person — more especially of a veterinary surgeon, who possesses a knowledge of anatomy. In the event of such assistance not being procurable, recourse may be had to

the services of an experienced shepherd or cowman, many of whom are, from extensive practice, well versed in the treatment of animals in such cases.

Soon after a mare is delivered of her foal, she usually commences cleaning it, by licking it all over with her tongue, in which operation she must not be disturbed or interfered with. During this process it is advisable to watch the progress of the after-birth, which will sometimes return—an event creating much trouble; and, when it does happen, frequently occasioning the loss of the mare. It may in most cases be prevented, if, as soon as it is perceived to be in the act of receding, an attempt be made gently to oppose that action. With the most exquisite tenderness and the utmost patience, the operator may thus in time draw it away; or rather, when, by that means, the half of it has come away, he may leave it to the course of Nature, which will generally be sufficient, still carefully watching that it does not again recede, in which case gentle manual assistance must be continued. There is, however, seldom any occasion to interfere in this part of the ceremony (though it is always advisable to watch the progress) till after the mare has cleaned her foal, when she should have a bucket of warm linseed gruel and a bran mash offered to her. As soon as the after-birth has fallen from her, it must be

carried away; and she should be suffered to remain as quiet as possible.

A little attention may be on some occasions necessary, especially with a weakly foal, to get it to suck; and though it should not be disregarded, it seems scarcely necessary to direct how this instinctive act of the young animal is to be fostered. The first impulse of the foal is an endeavour to stand upon its legs, in which attempt it meets with frequent disappointments. If weakly, it may scarcely be able to succeed without assistance, when the invigorating effects of the first drops of milk which it receives are wonderful. Although much watchfulness and attention is necessary from the time a mare is expected to foal, during the whole of this crisis, unnecessary intrusion should be avoided. Many mares are exceedingly annoyed by it; and being flurried, will sometimes accidentally injure their foals by treading on them.

The time of year, and the state of the weather, must determine the propriety of turning the mare and her foal into a paddock, or open court, where they can enjoy the invigorating influence of fresh air and the rays of the sun. Under favourable circumstances the sooner this can be done the better,—that is, when the foal can stand well on its legs, and the dam is not an invalid from cold, or any accidental cause. An hour or two, during an interval when the genial gleams of sunshine per-

mit, will produce an effect upon the young animal truly surprising. I have often seen a weakly foal so wonderfully restored by this bountiful influence of Nature, that it would scarcely be supposed that some magical power had not been exerted. Here it is necessary to urge the importance of adopting the utmost caution not to allow them to be exposed to wet, not even a shower of rain, on any account whatever. At any future period likewise the utmost attention is necessary to guard young stock from getting wet across the back and loins.

The woolly texture of the coat of a foal is of such a nature, that when once it becomes wet through, it is some time ere it gets dry again. There may be some persons who conceive this to be a species of unnecessary caution, and that under the impression of bringing up their stock more hardy they should be exposed to the casual vicissitudes of weather. A greater error cannot be committed. I can only remark that a state bordering on disease is not calculated to promote a robust constitution. A catarrhal affection, or cold, let it affect what part it may, is a disorder that should never be thought lightly of; frequently repeated, it becomes constitutional: thus, if the head, the glands, and the throat are attacked, they fall into an unhealthy state, and, when the strangles makes its appearance, it in all pro-

bability issues in a decided case of roaring. To rear stock that shall be hardy and robust, every event likely to produce disease, however trifling it may be in itself, should be carefully avoided.

The state of the bowels of foals demands particular attention. Constipation sometimes intervenes a day or two after they are foaled, and, if neglected, may assume such an obstinate character as to defy all remedies. A little care, and the administration of a clyster in due time, will almost always prove effectual. As foals increase in age, similar caution is necessary. A kind of constitutional constipation will sometimes show itself, which may generally be relieved by regulating the diet of the mother, giving her a plentiful supply of bran mashes, with linseed, and such succulent food as the season affords. More benefit is to be derived from the judicious change of food than is generally supposed, or, at all events, acted upon.

As the most safe, effectual, and convenient laxative that can possibly be given to horses of all ages, and of all classes, lard bears the preference when a remedy more active than a change of food is required; it should therefore always be kept in readiness in every establishment of horses, and although that is very good which is preserved in the ordinary way for household purposes, where there are a number of horses kept, it is desirable

to have a quantity prepared for the exclusive use of the stable department, according to the following directions.

> Take any quantity from the leaf of a pig; cut it into small pieces; put it into a vessel over the fire, and, as it melts, pour it off. To every pound of the lard add, while in a liquid state, camphor, in powder, two drachms. Stir it well, and run it into bladders or jars to preserve it from the air: keep it in a cool place. Thus prepared it will be good for two years.

From half a pound to a pound may be given to a full grown horse, whenever such a remedy may be necessary; and it may also be given to foals with safety at any age, regulating the quantity according to circumstances, and the strength of the animal. Being kept in a cool place it may be cut out in the form and size of a ball, and wrapped in paper in the usual way.

Diarrhœa, or relaxation of the bowels, is more frequently a source of trouble with foals than constipation. It seems scarcely necessary to remark that food of an opposite nature to that recommended for constipation is to be resorted to as the remedy. A quartern to two quarterns of bruised barley given to the mare daily will frequently set the matter to rights in a very short time. It generally proceeds from the food with which the mare is supplied; a change, therefore, is advisable. Sometimes the green food being cut

when wet, will produce it; for which reason I have suggested the propriety, when rainy weather prevails, of having it cut the day before it is used, and spread in a dry place. The first consideration in these cases is to endeavour to trace the origin of the evil; with a little attention it may generally be accomplished: if that cannot be accounted for, the purging in all probability proceeds from acidity in the stomach of the foal, which will require some of the medicines usually had recourse to in such cases; the most simple and efficacious of which is carbonate of soda, in doses of half a drachm, to be given in a small quantity of mash twice a day.

Foals will begin to eat corn at a very early age; they will learn it from their mothers; but the latter are sometimes so greedy and selfish as to drive their offspring from the manger, more especially as the foals grow up. The inclination which the young animal evinces for corn should be fostered by every practicable means, especially when it has attained the age of two or three months. If the dam is resolutely opposed to this measure, it will be desirable that she should be tied up, or secured at a distance from the manger, till her foal has partaken of as much corn as he may be inclined to eat.

Worms will be sometimes found to annoy foals exceedingly when they have attained the age of three or four months, or even earlier. To enter

into an inquiry concerning the generation and means whereby these parasites enter the stomach of the horse, would occupy much time probably without affording equivalent satisfaction, as there are doubtless a variety of circumstances under which they are engendered. Observation would lead to the conviction that the grass from some particular fields is predisposed to the production of these insects, and that the stock, when partaking of such grass, are more subject to be troubled with the intruders than when fed with the produce of other land. It must therefore be inferred that the larvæ of certain species of worms are deposited on the grass. Horses are much more likely to be troubled with these insects when turned out to eat the grass, than when it is cut and brought to them. When it is decided that the herbage from any particular field has this prejudicial effect, it will be advisable to top dress it with lime or agricultural salt; either of which applications may be used with good effect on land from which food is raised for the consumption of horses. The lime should be spread alone in the spring, or at all events when the grass is short, and it should be recently procured from the kiln. Salt requires to be mixed with earth, and in either case the spreading must be performed at a period when the immediate use of the food can be dispensed with for a term of at least five or six weeks.

The indications of the existence of worms in

the stomach of foals, and the treatment best calculated to destroy them will be found under a distinct section, at page 150.

The feet of foals very seldom receive the care and the frequent inspection so essentially necessary to their future perfection of form and soundness, and from want of which so many imperfectly formed, defective, unhealthy feet perplex the trainer of the race horse, and the proprietor of those of other classes,—often rendering the value of an otherwise good animal very trifling. With attentive care, and judicious management from infancy, the foot may be induced to assume almost any form that is desired.

When foals are turned out in very dry paddocks, more especially in dry seasons, the feet, unless properly attended to, will not grow with sufficient luxuriance; for this there is an effective remedy. On the other hand, during very wet weather, on wet soils, they may be induced to grow too fast, and assume a bad formation—becoming thin and flat. Here it must be observed that very much of the foot, that is, the texture of the horn or crust, frog, and sole, depends upon the soil on which the foal is reared.

It is very easy to introduce artificial means of presenting a sufficiency of moisture to promote their healthy growth and development. A couple of barrowfuls of clay or soil retentive of moisture may be deposited in a part of the yard or paddock

where the manger or receptacle for food is placed, so that the inmates will stand in it during the time of feeding; this must be kept soft with water, when moisture is required; a little common salt may be occasionally sprinkled on it with good effect. In many cases the clay may be dispensed with merely by throwing water on the spot where the horses stand to feed — that is, unless the soil is very sandy and dry.

Proper attention to the appearance of the feet will dictate the treatment they require. Many defects of those parts, which are observable in the parents, and which may, in some degree, be denominated as hereditary, can doubtless be improved to a certain extent in the offspring. It is very desirable that a foal should, at an early age, be accustomed to have his legs handled; and, by degrees, he will, without being alarmed, suffer his feet to be taken up; when, if any little ragged or uneven portions present themselves, they may be removed with a drawing knife. Many sandcracks in embryo may thus be avoided, which, if once permitted to establish themselves, are accompanied with considerable trouble and inconvenience. When a brittle condition of the hoof prevails, the foot should be dressed two or three times a week with tar ointment; and the subject induced frequently to stand in wet clay. The following will be found an effectual composition: —

TAR OINTMENT.

Lard or Tallow - - - - -	2 lbs.
Tar - - - - - - -	1 lb.
Treacle - - - - - - -	½ lb.

To be melted together, well stirred, and applied warm on the soles and hoofs.

Inequalities in the growth of the foot often require attention. If neglected, it will sometimes happen that the foot of a foal is broken on one side; consequently a greater portion of the weight of the animal is thrown on that side; and if it continues to be worn down, or is again broken, the uneven bearing causes the leg to grow crooked; this will often occasion a horse to turn the toe of one foot in or out, more than the other, according as it is the inside or outside of the foot which has been reduced or broken away. In fact, the form of the leg is capable of much alteration by attention to that part of the animal while in a growing state; but as this treatment is seldom found necessary till the young animal comes under the denomination of a Yearling, the subject will be found more copiously discussed under that head.

The period at which foals may be most advantageously weaned is determined by a variety of circumstances; as, for example, the quantity and quality of milk which the mare affords, her constitution and condition, and the question of her

being again in foal. When a deficiency of milk is apparent the young animal cannot gain much benefit from a lengthened companionship with its mother, while the latter may be considerably reduced in her condition; and, when the milk is abundant, the postponement of the weaning-time may be advantageous to both. Mares whose constitutions are weakly and delicate, and those which have experienced illness, will not impart much that is desirable to their progeny; with such, an early separation may be advocated. If they be low in condition, they will, of course, be relieved by having their foals taken away at an early season. Also, if a mare is early in foal, it is obviously not desirable to permit her last-born to remain late at her foot. The age of a foal will likewise be a most important criterion to regulate the determination. Under ordinary circumstances the most favourable time for weaning foals is during the month of September, making the distinction between those which are dropped early in the season, and those which are late, assigning to them relative periods in the month, and being guided also by circumstances already mentioned.

A few weeks before the time for weaning has arrived a small head-collar should be put on each foal, and it should be made with a strap about eighteen inches long, by which the young animal may be held and occasionally led about, as a sort

of preliminary exercise of education. This will occupy some little time and occasion some trouble; but it will be fully compensated for in case of any illness or accident; hence, it cannot prudently be dispensed with.

Secure and convenient boxes are imperatively necessary for the accommodation of foals when they are weaned; if situated at such a distance from similar places assigned to the mares, that they cannot hear each other, the quietude of both will be the better provided for. No half-doors or windows can be tolerated through which they might be tempted to endeavour to force their way, and care is always necessary to avoid their rushing through doorways when opened for the purpose of egress and ingress.

The practice is very common of assigning one box to the accommodation of two foals, of course, of the same sex, under the impression that by such an arrangement they are better reconciled to the estrangement from their dam, which is no doubt correct; but there is an objection to this custom, by no means compensated for by any advantage of that nature. It is this; one foal is certain to obtain the mastery over the other, and, being constantly harassed and driven about, the underling never thrives equally with its bolder companion; moreover, and which is of still greater importance, being driven from the manger at

feeding-time, the weakly animal does not obtain the intended allowance of corn, though its feebleness should plead for an additional portion. The only circumstance that can reconcile us to this custom is want of sufficient accommodation, in which case two mangers should be provided, as far apart as possible, so that each foal may be more regularly and equally fed; nevertheless, the master foal, having consumed its corn first, will be very likely to exhibit its tyranny, by driving away its companion, and picking up all the crumbs that may be left; in which case the former should be racked up.

Mares should be examined after their foals have been taken from them, to ascertain the condition of those vessels in which their milk is secreted; when there is an abundant supply, means must be adopted to diminish the secretion, and absorb that which may be deposited. Blood mares, however, are seldom inconvenienced with a superabundance of milk at any time, especially at this crisis, more particularly if they have been judiciously restricted in the kind of their food for a few days previously to their foals being taken from them, at which season old hay is the most proper aliment. It may be necessary to draw off a small quantity of the milk once a day in the event of the vessels appearing to be distended, but that should only be done to an extent suf-

ficient to relieve the animal from inconvenience. Goose-grease and brandy, or any other spirit, in equal portions, may be rubbed on the part with good effect, provided the milk exhibits symptoms of depositing itself, and the udder is thereby in a state of tension. Recourse may also be had to bleeding, if the condition of the mare and attendant symptoms indicate the necessity. Till the secretion of milk has thoroughly subsided, dry food, that is hay and corn, in restricted quantities, is most proper.

CHAP. VI.

FOALS AFTER WEANING.

Foals deprived of Milk require Good Keep. — Linseed Gruel. — Carrots. — A Trainer's Opinion of them. — Swede Turnips. — Food suitable to the Constitution. — Change indicated by the State of the Bowels. — Caution to be observed with newly weaned Foals. — Confinement deprecated. — Wet to be avoided. — Necessity of Exercise. — Habits of the Horse in a State of Nature. — Consequences of Colds. — The Approach of Winter. — Frost. — Shelter sanctioned by Reason. — Degrees of Exercise.

ALTHOUGH a mare may not yield much milk at the time of her foal being taken from her, yet that which she does give is of a very nutritious quality, provided she is in good health; the loss must, consequently, take effect upon her offspring; hence good keep is essential at this crisis. Robust foals will consume nearly, if not quite, two quarterns of oats daily, up to which quantity they should not be restricted. The hay they will require is but trifling in amount. Bran mashes are of course to be included in their dietary, twice or three times a week, according to the state of their bowels; and I would earnestly recommend that linseed gruel should be given as

their ordinary drink, at all events, through the first winter, whether it be given afterwards or not: I have seen the most marked advantages from the use of it. So small a quantity of linseed is sufficient for the purpose, that the trifling addition of expense incurred is not worthy of consideration, compared with the benefit the young stock will experience; in fact, the trouble occasioned by the preparation of it, is a point more to be considered than the intrinsic cost of the seed.

Carrots for horses of all ages are used in some establishments without discrimination; but from the effects which I have witnessed from these esculents I cannot sanction them. My attention was first drawn to the mischief produced from carrots, by a very celebrated trainer, who showed me some yearlings which had been sent to him by one of his employers: they had been well kept, but there were slight symptoms of eruptive blotches or spots on their skins, which increased as they were put forward in their work, requiring much care to eradicate. He told me he invariably found this to be the case with all horses which had been supplied with them to any extent. This led me to investigate the matter; and subsequent observation has convinced me that the trainer's opinion is quite correct. Swede turnips or parsnips are far superior, and may be given to

foals in small quantities for the sake of change of diet. There are, however, some weakly animals to whom nothing of the kind is suitable. It is therefore highly important to ascertain the constitution of each individual as early as possible. A foal that has exhibited habitual or constitutional relaxation while with its mother, could scarcely be expected to thrive afterwards upon food of a succulent nature. The indications of unthriftiness, by the appearance of the coat, deficiency of appetite, want of muscle, and the absence of that gaiety and spirit which healthy young creatures are wont to evince, particularly when at liberty in a paddock, will readily operate as a warning to an attentive observer that something must be wrong; he will, therefore, endeavour to discover the cause of the evil; and will generally find that a judicious change of diet will effect every thing that is necessary.

The state of the bowels, that is to say, the information which may be obtained from the appearance of the evacuations, will frequently suggest the most suitable change of food for the establishment of health; for at any rate, an alteration should be made. In some cases a small quantity of split beans may be given to young stock, especially such as are of a weakly washy character, with good effect; though, I must confess, I cannot recommend them as a general diet

for any horses, unless they are in strong work, or a tonic is required. Their effects should be carefully watched.

A few days must be suffered to elapse after the foals are taken from the mares before they are let out into their respective paddocks, in order that they may become reconciled to the separation. Their enlargement, at first, need not exceed an hour or two, during which period it will be desirable to keep a watch over them that they do not get into mischief. Foals that have been accustomed to kind and familiar treatment from the time of their birth, will on this occasion give far less trouble than those which have been allowed to run in a comparatively wild state. The former will be readily recalled to the house when required, the latter will often cause much difficulty.

The custom adopted by some few persons of attempting to rear racing stock constantly confined in hovels or loose boxes from the period of their being weaned, is too preposterous to admit of an argument. When the weather is favourable, foals should at this age be permitted to enjoy the range of their paddock or yard from ten or eleven o'clock in the morning till four in the afternoon, that is to say, from October till April or May, when fine weather and length of days will permit a more extensive term for exercise in the open

air; an indulgence which they hail with delight, and which is essential to their health as well as to the full development of their bodies.

I have already noticed the danger to be apprehended from a foal getting his back wet; but the subject is so important as to call for a few additional remarks.

The first question to be determined, is this:— Is robust health, or a state bordering upon indisposition, the most likely to constitute an animal which, having arrived at maturity, may be expected to be in possession of its physical powers in their utmost development?

With the full assurance that the former alternative will be approved, the next inquiry arises, What course of treatment is best calculated to obtain robust health, and what is likely to cause indisposition?

Upon the practice of rearing foals in confinement, a few words only will suffice. Unaccustomed to the free exercise of their limbs, no animal can generate in its growth that volume of muscle provided by nature for the purpose of giving them energetic motion. Deprived of the means of exercise, neither muscles, sinews, nor joints acquire that texture so important in race horses, and, in fact, those of every other class; a certain portion of exercise and pure air is also essential to the promotion of digestion. The consequence

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is, that animals that have been reared in a positive state of confinement give way in their joints or sinews very soon after they are put into training, unless a great length of time be allowed to prepare them for the ordeal, and even then, they very rarely stand their work satisfactorily. The hothouse treatment to which they have been accustomed renders their frames and constitutions incapable of enduring any kind of labour. To establish vigorous health, every animal requires exercise in proportion to its age; this we find nature renders imperative with those which are not kept in a state of domestication, in the necessity which exists of their roaming about in search of food. It is in those cases regulated by age, and increases as the animals arrive at maturity. Take, for example, the horse, which is reared in the wild mountainous districts of Wales, approaching, in the nearest degree we have in this country, to a state of nature, where stallions, with mares and foals, are turned out to provide for themselves, and where the young ones are selected at the age of two or three years, and then brought to subjection for common purposes. These animals of course never attain the power and symmetry of those which are more carefully treated; and it is merely as an illustration of the provisions of nature that the subject is introduced. In this case, the foal, experiencing a

deficiency of support from the milk of its dam, soon begins to cull the scanty herbage within its reach; when, at length, the milk entirely fails, it has no other alternative but to seek its own food, at which period an estrangement takes place between the mother and her offspring; and as the latter grows older, and requires a greater supply of food, it is obliged to go over a greater space to procure it. The fox may likewise be introduced as another example. The cub when first produced is sustained by the milk of its mother, who, as it becomes older, provides it with rabbits, rats, mice, frogs, and perchance a disabled pheasant; but when the young animal is capable of partially providing for itself, the vixen is less assiduous in her attentions, when hunger prompts the young cub to make an essay for its own support, and at length it is left to its own devices and resources for procuring food. Every fox-hunter is aware of the difference in point of stoutness, stamina, and vigour, between foxes which are bred in districts where their food is scanty, and where they have consequently a great distance to travel in search of it, and those which are bred in preserves abounding with rabbits which they can secure without exertion.

But to return to the consideration of exposing foals to the vicissitudes of the elements. If they are frequently subjected to the effects of wet,

catarrhal affections are superinduced; they may be slight, scarcely even perceptible, or they may rage with intensity; but even under slight influence, if frequently repeated, such disorders are calculated to affect the system of young and delicate creatures most seriously. As this subject is of so much importance, a somewhat minute inquiry into the manner in which catarrh or cold is produced, together with its consequences, appears to be indispensable.

Cold may be simply accounted for and explained as arising from a sudden chill, either in consequence of the animal being exposed to a current of air when the body is in a state of perspiration, or from the effect of wet; either of which, by creating a great amount of evaporation, is productive of similar results. It arrests or stops the flow of perspiration, which, to a certain extent, during health, is constantly escaping; but that, being returned into the circulation, charges it with exhalations destined by nature to make their escape. What therefore becomes of these morbid exhalations? They must lurk in the constitution, or rather the circulation of the animal, not only till after a reaction has taken place, but likewise till absorption and evacuants have had time to effect their removal; during which period this morbific matter will act very injuriously upon those parts most susceptible of irritation,

the trachea and the lungs, essential portions of the animal economy — the mediums through which the vital principle of the atmosphere is conveyed to the blood. By repeated colds, an unhealthy state of the lungs is produced, and a vitiated condition of the blood is occasioned, the origin frequently of cutaneous disorders, swelled legs, blindness, and other catastrophes.

A disordered state of the lungs produced by a severe cold, or slight ones frequently repeated, is one of the most serious evils that can happen to an animal required to undergo the severe labours of the horse; inasmuch as whatever derangement is produced in that organ, the powers of respiration and expiration must be impeded in an equal ratio to that in which the disorder prevails. It is a circumstance likewise worthy of remark, that chronic congestion of the lungs is generally discovered, more or less, on a *post mortem* examination of horses that have been called upon to undergo any quick and distressing performances. Very few horses perfectly recover from the effects of serious attacks of inflammation of that organ. Colds must therefore be regarded with the greatest apprehension. Habitual or chronic coughs, so prevalent among horses, may generally be attributed, and often traced, to colds caught when young, but which, being slight, have not been attended to at the time. Nor is it the lungs only

that will in all cases be injured by colds; the trachea or windpipe is often the seat where their baneful consequences will be established; by exciting the membrane to a state of inflammation, a deposit is formed, ossification follows, and roaring is occasioned more or less violently. It is not perhaps the slight cold that may do this mischief, but the slight cold frequently repeated establishes an inflammatory condition of the trachea, which in course of time becomes chronic. The strangles or a severe cold supervenes; sometimes the epidemic called influenza, a similar disorder; either of which being attended with considerable inflammation, roaring ensues in its worst form, and the animal is of little value.

The most dangerous condition to which any horse under such circumstances can be exposed, whether young or old, is that of being allowed to gallop and gambol about during a gleam of sunshine in showery weather, till the circulation of the blood becomes excited, and profuse perspiration ensues; and if the animal is permitted to remain out of doors till the rain descends, an immense amount of evaporation, as already described, is produced under the most unfavourable circumstances.

When the winter months have set in, foals must of necessity be more constantly shut up, not only on account of rain or snow, but also

during frost, in consequence of the danger to be apprehended from their slipping down and injuring their limbs. It is very evident that by nature they were not intended to inhabit frozen regions, for their feet are peculiarly ill-adapted to sustain them with security on ice-bound surfaces. They must, therefore, under these circumstances, be kept from harm by artificial contrivances. The whole system of breeding and managing horses in this country may at the first glance appear to be artificial; upon mature investigation, however, it will be found to be so only to a certain extent: there are many laws of nature which must be obeyed. If housing them is looked upon as an artificial resource, it is justifiable in reference to the difference of climate which prevails in England to that which characterises the eastern hemisphere, whence the thoroughbred horse was originally transplanted. The exercise, which they as well as all other animals require, was ordained for their welfare, and in their management, man regulates that exercise simply in regard to its extent, the amount of which is determined by the immediate purpose for which the horse is required. Is it not, therefore, totally inconsistent with reason to suppose, that the object of a horse's services can be obtained by keeping him for a length of time in a state of inactive confinement, and then all at once calling

forth, and expecting to gain, the most powerful energies which an animal of that class is capable of affording? There are two degrees of exercise which may also be subdivided; the one for the purpose of maintaining health, and promoting the development of the frames of young animals; the other to render them capable of performing quick and laborious exertions. The former only appertains to animals of the tender age at present under discussion.

During the prevalence of inclement bad weather, all the favourable intervals that can be embraced will, perhaps, be scarcely sufficient for foals to enjoy a proper amount of exercise; but as it is impossible to influence the elements, the only alternative is to allow them as much as circumstances will permit.

CHAP. VII.

YEARLINGS, TWO YEARS OLD, AND OTHERS.

Rules of the Jockey Club concerning Age. — A Late Foal. — Leading Yearlings to Exercise. — Enlargement in the Paddock. — Wisping over. — Appropriate Places for Exercise. — Attention to the Feet. — Thrushes. — Foot Lameness commonly attributed to the Shoe. — Frequent Cause of Thrushes. — The Frog and its Properties. — The Structure of the Foot influenced by Thrushes. — Incipient Lameness the Result of Inattention. — Cure of Thrushes. — Tar recommended. — The Legs. — Frequent Cause of Crooked Legs. — Upright Pasterns. — Oblique Pasterns. — In some Degree may be remedied by Attention to the Feet. — Spontaneous Growth of Horn. — Brittle Feet. — Allowance of Corn. — Healthy Condition preferable to Fat. — Castrating. — Its Effects on the Coat. — Half-bred Stock.

ACCORDING to the rules and regulations of the Jockey Club, by which all racing men are guided, a foal dropped at any time during the preceding year is denominated a yearling on the 1st of January; thus, one that happens to be foaled on the 31st of December would be called a yearling on the following day, and have to carry weight equal with those having nearly a year's advantage. Whether on such unfortuitous occasions they are not sometimes kept out of sight for a day or two, it is not necessary for me to inquire. In treating

on the management of yearlings, it would be preposterous to adhere to this distinction. It must, therefore, be understood, that such as come under the denomination of yearlings are foaled some time between the 1st of January and the month of June, later than which a foal ought not to be desired. I once possessed a mare called Vigornia, bred by the late E. L. Charlton, Esq., of Ludford, that was foaled in October; but she was of very little value as a race horse, having to give generally six months, and sometimes more, of her year to her competitors in weight for age races; and handicaps were not, in those days, prevalent at provincial meetings.

As the spring advances, it will become advisable to lead those foals about which are intended for racing purposes; those of any other class require no alteration in their treatment from what they have hitherto received, unless it be that they should be allowed a greater portion of time for exercise in their paddocks or yards. It is, however, at this time, necessary to render thoroughbred stock, especially such as are intended to run at two years old, familiar and tractable by degrees: they should at first be led about with a cavesson and lounging rein, after which a bit must be put into their mouths without any reins to it; and they may be suffered to play with it themselves two or three hours daily, being at the

time shut up; after this, it will be proper to put a roller on their bodies, and by degrees all the paraphernalia of breaking-tackle introduced to their notice. When time and the weather permit, besides being led about, they should be allowed the freedom of exercise in a paddock, as essentially beneficial to their health and growth. Unrestrained privilege at this age is of the utmost service in promoting the development of the whole frame and the suppleness of their limbs. The ceremony of wisping over may commence when they are first led about; it contributes to their cleanly appearance, and accustoms them to the operation. Thus, by almost imperceptible degrees, the ordeal of breaking, as it is technically expressed, will be accomplished under the most favourable circumstances, and should, in fact, commence before the time of weaning by means of the head-collar and short strap attached, as already mentioned.

The selection of appropriate places for this kind of preliminary exercise, demands some notice. A turnpike road is not the most suitable place, inasmuch as a young horse, in his frolic and play, may fall down and cut his knees; neither is a perfectly level surface the only one to be chosen. Turf, possessing some inequalities or unevenness, for occasional visits, will have the good effect of teaching them the use of their limbs. Ploughed fields,

when not too deep, or, on the other hand, too hard, will have a similar effect; besides which, walking about on that kind of soil has a very beneficial effect on the feet. Stony places, it is almost unnecessary to add, should be carefully avoided, or uneven surfaces, when the ground is hard. When it is found necessary to take them out in frosty weather, some artificial arrangement may be required, such as tan or straw. When there is snow on the ground of a sufficient depth to prevent their slipping, providing it does not clog or ball in the feet, it forms an excellent covering to the earth for the purpose of exercise to animals of a more mature age, and those which are more than a year old will derive benefit from the practice, if judiciously conducted. Every device or contrivance whereby exercise can be safely obtained during inauspicious weather, should be eagerly embraced. It must be remembered that the circulation is considerably less active in cold than in warm weather; no other argument, therefore, can be necessary to enforce the advantages arising from exercise in order to promote health.

Attention to the feet is a subject of great importance. An able writer on the treatment of horses' feet has asserted, that thrushes arise from bad shoeing; overlooking, however, one very important fact, that they arise also from other causes. While it is not to be denied that bad shoeing may

produce them, it is somewhat remarkable, that any person intimately acquainted with the management of horses, can have overlooked the causes which produce them in feet on which the iron appendage in question has never had an opportunity of exercising this baneful influence. Many more of the ills which the foot of the horse "is heir to" are ascribed to the shoe and the unlucky disciple of Vulcan than they deserve. When, from causes totally unconnected with the shoe or its application, any disorder of the foot or lameness is apparent, the blacksmith and the shoe are often condemned without further inquiry. Some foals may not give evidence of lameness, the moment it is established; but as soon as they are put to work, the infirmity is discovered, and consequently people fancy it must proceed from bad shoeing. Thrushes in the feet of foals and young horses, often lay the seed of future lameness. They frequently arise from exposure to wet, aided by the corroding properties of dung and filth. It may be alleged that blood stock, under ordinary good management, could never be in such a disgraceful state. I can only declare, that I have not unfrequently noticed it in establishments generally considered well regulated, and there are many such, where the feet are never attended to till the time for backing the animals approaches,

when the absolute necessity for shoeing renders the inspection indispensable.

When the nature of the frog is considered, its office, and its susceptibility to cariousness, with its effects, in that state, upon nearly the whole of the internal structure of the foot, our reasons for directing attention to its preservation will be evident. In a healthy state it is an elastic substance, and acts as a kind of cushion to assist in protecting the foot from concussion. Some persons are of opinion that it is a medium by which expansion of the heels is effected; but to that view I cannot subscribe. It is too elastic for that purpose, and being much more so than either the crust or sole, it would be futile to suppose it can possess a greater power in that respect than a less yielding substance. But that it is a medium by which the faculty of expansion is permitted, I will readily admit. The impression that the frog possesses the power of expanding the heels has no doubt arisen from the fact that when that part is in a state of disease, they generally contract. If disordered with thrushes which cause pain, the animal, in order to relieve itself from suffering, ceases to bear the accustomed weight on the heels, which, in the absence of pressure so produced, become contracted; and thus the diseased frog is a party to the disor-

ganisation. In young animals this becomes a source of considerable mischief; instead of the heels and quarters participating in proportionate growth with the other parts of the foot, they continue, so long as thrushes prevail, in a normal condition; thus, when the animal has attained its full age, the heels are narrow in proportion to the other parts of the foot. The inconvenience thus established being internal, is not always detected until it is too late. The outer frog not being supplied with nerves, does not possess the attribute of feeling; but underneath that is the sensible frog, formed of what appears to combine the qualities of tendinous fat, and endowed with the faculty of elasticity to a much greater extent than the outer frog. When thrushes exist for any length of time, and acquire a degree of inveteracy, they not only suspend the ordinary development of the sensible frog, but by their discharge, inducing absorption, cause the latter to assume an unhealthy degree of hardness, or consistency, incompatible with its utmost power of elasticity. Hence, when the animal is required to work, sufficient protection from concussion is wanting, and this being augmented probably by soreness in the feet, produced from other causes, inflammation commences, which eventually increases till the animal becomes in-

capable of being trained or otherwise worked. I do not, however, mean to assert that horses who never had thrushes in their lives will not sometimes become similarly affected in their feet by absorption of the fatty frog; but I have no hesitation in stating that horses who have been troubled with bad thrushes, are very susceptible of foot lameness, even when they are cured; and as they are easily prevented by ordinary care, and readily cured on their first appearance by proper treatment, there is not the slightest excuse for their prevalence.

Should the least indication of thrush present itself, let the foot be fomented in warm water; or, if the subject has not been sufficiently domesticated and rendered so tractable as to permit that ceremony being performed, let the foot be carefully washed, the ragged parts of the frog cut away, and the part dressed with tar ointment; or should the thrush have attained any degree of inveteracy, a small quantity of compound tincture of myrrh may be poured into the cavity previously to the application of the tar, which will not fail to promote the cure. It will correct the fœtid character of the discharge, and stimulate the secretion of new frog; and although many persons use without reserve strong styptics, such as the sesquichloride of antimony, sulphate of copper, or other powerful caustics, as there is no necessity for

such powerful agents except in bad cases, a milder remedy is surely more rational, especially when young animals are to be dealt with. Tar should be frequently applied to all frogs which evince a disposition to generate thrushes; and with such horses as have had shoes put on their feet, it is advisable to stop them frequently with dry tow, which affords a most salutary support to the foot.

The legs of young horses may be very aptly compared to willow twigs, which you may bend to any form you please. By careful attention many imperfections may be remedied, relieved, or reduced in extent. The form and proportion of the shoulders in a great measure regulate the position of the legs, and have most essential influence over their action; and although we cannot alter the symmetry and adjustment of the body, there are many little attentions which, if judiciously directed, will materially improve the legs as well as the feet.

By observation it will be found that many of the imperfections in the form of horses' legs may be traced to a portion of the hoof having, at an early age, been broken away or chipped off; thus the other side of the foot grows more redundantly, and the lower portion sustaining more wear, an uneven bearing both for the foot and leg is created; and, unless by chance the opposite side

of the hoof meets with a similar accident, or is removed by the rasp or drawing knife, the leg assumes a bad, most probably a crooked shape. This malformation may frequently be observed in one leg, while the other is perfectly straight and well formed. The same principle, which, by accident, causes the limb to assume a peculiarity of growth or shape, may be beneficially resorted to for the purpose of remedying a defect, or making good the consequences of an accident. If the pastern joints show a disposition to grow too upright, they may be improved, if taken in time, by lowering the heels. That must, however, be done by degrees, when it may be eventually considered necessary to increase the effect by putting tips or half shoes on the feet; on the other hand, should the pasterns assume a form of too much obliquity, shortening the toe will afford some assistance. These operations of course require to be performed with discretion; nor can they in general be attempted until the subject has attained some growth; most probably they will not show any necessity for so doing till they are more than twelve months old; yet they should be carefully watched in their progress.

Another favourable result attendant upon these suggestions is this:—that the same practice which is calculated to improve the form of the legs, will, in most cases, be equally bene-

ficial to the feet; because it generally happens that horses whose pasterns are upright have high heels, and those whose pasterns have too great a degree of obliquity, are low and weak in the heels. I have seen the toes of foals which have been neglected grow to an extraordinary length, amounting almost to a deformity, by which nearly all the weight of their fore-quarters has been thrown upon their heels. In such cases, unless timely relief is afforded, it is scarcely necessary to intimate what the result would be.

Spontaneous growth of horn on one side of the foot will have the effect of causing the leg to grow crooked, and possibly occasion the animal to turn his toe in or out, as the growth of hoof on either side predominates. But attention in reducing the foot to a proper level, will naturally assist in averting the evil.

If the crust or wall of the foot becomes hard and brittle, when unprotected by a shoe, it is very apt to be broken off at the edges; to prevent which, they should be rounded a little with the rasp, otherwise they will sometimes shell off; and when in that hard state the hoof has the effect of confining the natural growth and development of the internal structure, which requires relief by the application of the tar ointment and moisture.

Yearlings in good health will no doubt consume

as much as three quarterns of corn daily; perhaps many would eat a greater quantity; but it is more than doubtful whether the extra allowance would be beneficial to them. Racing stock, especially such as are intended to be trained at two years old, will require it; for those of other classes, two quarterns per diem will suffice. Good sound healthy condition is the object to be sought for, not the accumulation of fat to an extent that would excite the envy of a candidate for honours at the periodical exhibition of the Smithfield Cattle Club. Before an animal is put to that kind of work which produces a considerable amount of perspiration calculated to carry off the superfluous humours and fat engendered by high keep, it is not only injurious, but dangerous to overcharge the system with such an abundance; indeed it tends to retard rather than augment the development of muscle, the increase of sinew, and the deposit of bone.

Linseed gruel may be given with good effect to all young stock, especially during the winter months, not with a view of making them fat, because it should not be made sufficiently strong to do so, but it is admirably calculated to soften the water, and its balsamic effects on the stomach and urinary passages are followed by the most favourable results.

Those yearlings which are not intended for racing will, in all probability, be doomed to the operation devised for preventing them from propagating their species, and the more significant motive of keeping unruly tempers in subjection. It may be in many instances inconvenient to postpone it longer, because that entails a necessity for providing them with separate apartments. There is a certain phenomenon attendant upon this operation, of which I never could obtain any satisfactory explanation. Colts which have been emasculated when their coats are long and rough, are never fine during the winter season, whereas those which have been operated upon when their coats are off, most invariably look well; and as I entertain no doubt whatever of the fact, although I cannot give any reason why it is so, I would certainly suggest the propriety of selecting a time when the animal is in a suitable condition. The months of May or June are certainly to be preferred to any other period: if performed earlier they will not have shed their coats; and if delayed longer, hot weather may be prejudicial. As it is the province of the operator to give his own directions relative to treatment, it is quite unnecessary for me here to intrude upon his practice.

Very little need be added respecting the general management from the time of weaning to that of

breaking such stock as may not be calculated for the turf. They require precisely the same attentions as those already recommended for thoroughbred yearlings. The same remarks will apply with regard to their feet and legs, their constitutions, condition, food, and exercise.

CHAP. VIII.

BREAKING.

Maturity promoted. — Breaking Tackle introduced. — Bitting. —Lounging. — Boots or Bandages. — Action improved by Uneven Surfaces. — Anecdote of a Hunter. — Lessons in Leaping. — The Dumb Jockey. — The Palate, or Slabbering Bit. — Crouper. — Straps, and Divers Objects. — Putting a Rider up. — Importance of a Good Mouth. — Reins, and Application of Bridles. — Efficiency of the Bit used by the late Lord George Bentinck. — Nose Bands. —Pelhams. — Gagsnaffles.

It is from judicious management when young that much of the horse's superiority may be expected, and it is by preparing him by degrees for whatever work he may be required to perform, that facilitates his maturity, and brings him eventually to the utmost state of perfection to which he is capable of being brought. Many horses are injured by being put to work too early, or, having been reared in a state of inactivity, are put to work without a gradual and systematic routine of exercise, between which and work there is a vast distinction. It is the degree of exertion which they are capable of enduring at certain ages, and under certain circumstances judiciously directed, that

renders horses capable of performing great achievements, but which, in point of fact, are only so by comparison, and should never be suffered to occasion unnecessary distress.

Presuming the young animal has already been accustomed to be led about by means of a cavesson and lounging rein, the next ordeal he has to submit to is that of having a roller put on his body, which should not at first be buckled tighter than is necessary to prevent it from slipping back and getting into his flanks. After this, he has a bit put into his mouth, a plain thick snaffle with a ring in the centre, on which some droppers or pieces of metal are fixed in order to induce him to play with them, which occupy his attention and also prevent the mouth from becoming dry and insensible. On these occasions a very great error is frequently perpetrated by fastening the reins tight upon the roller: during the first few days it is better not to use any reins at all, or, if they are used, they should be so slack as not to cause any restraint whatever on the bit: by this means the colt is induced to move his lips and tongue, and play with or champ the bit, which he will continue to do after this introduction when the reins are properly adjusted, and will then in due time have a good mouth; whereas, if the reins are drawn tight at first, he will contract a habit of hanging on his bit, in all probability getting it on

one side of his mouth, a bad propensity, which, when once acquired, requires some time and patience to correct. He will also, perhaps, take a position in one corner of his box, there stand and sulk, but if the bit in the first instance be put in his mouth without any reins, properly adjusted by means of the head piece in the centre, he cannot by any contrivance either hang upon the bit or displace it from its uniform position. With the bit on, it will also be advisable to lead him out for an hour or two daily, and when he has become reconciled to it, the reins may be introduced and fastened to the roller, but only strained sufficiently tight that he may just feel them.

The next ceremony is that of lounging: it is an exercise very frequently carried on to a most unconscionable extent. Introduced, originally, for the purpose of subduing animals that had been neglected till they arrived at an age when their tempers became resolute, the custom of severe lounging has become one which many persons concerned in the management of young horses look upon as of paramount necessity, without any regard to the consequences which follow, or the motives which originally led to its adoption. One of these was evidently with a view of saving time. A resolute, uncultivated creature, four or five years old, that would neither lead nor drive until brought to subjection by fatigue, probably

might appear to require such usage as the only alternative, unless an unreasonably lengthened period could be appropriated to render the animal tractable. "Lounge him till he is tired" is the usual exclamation and practice of the provincial colt breaker, whenever he meets with a colt who is a little difficult to manage; but by such men more horses' tempers have been spoiled than improved. Harassed and overcome, the poor brute submits sullenly to the coercion of the individual whose duty it should be to obtain by kind treatment and patient attention, that which he vainly attempts by ruffianism. Thus a temper, characterised by gloomy cowardice is formed, instead of cheerfulness and courage. Such ought never to be the treatment of any stock, much less that which is thoroughbred, and intended for the purpose of racing. Their young and delicate limbs will not sustain the rough exercise of severe lounging, neither is it at all necessary for any beneficial purpose. A little now and then is all very proper: it teaches them the use of their limbs, renders them supple and active, and as an exercise, discreetly regulated, is very desirable; but judging from the effect it produces when practised upon horses of mature age and in hard condition, I have no hesitation in stating that it is the most severe work a horse can be subjected to, that is, when it is continued for any length of time, and the poor

animal is made to go at a fast pace on heavy ground. I have seen old hunters put through this manœuvre; under the impression, that in consequence of there not being any weight on their backs, their legs sustain no injury. But it is a most mistaken idea. Constantly working on a circle, horses are extremely liable to hit their legs, and for this reason boots or bandages should be invariably used whenever horses are lounged.

The action of some horses is such, that they scarcely move in certain paces without striking or hitting their legs, yet there are many who scarcely ever do so, and others who never touch their legs except by accident:—for our present purpose, therefore, they may be divided into three classes. With those of the first there is but one alternative,—their legs must be protected, or inflammation will speedily be established, and eventually lameness. The second class will be very likely to labour under the same infirmity unless means are adopted for their security; and the third class will scarcely require protection to their legs unless some particular exercise, such as lounging, entails the probability of an accidental blow.

After these premises it may naturally be inquired, what objection can be stated to the use of boots? Simply this; that they are productive of

some heat in the leg by the friction which they occasion. Much, it is true, depends upon their fitting, and the way in which they are put on; but, however well they may be made, softly lined, and properly adjusted, they will, to a certain extent, produce heat in the legs. When very nicely put on, I believe bandages to be preferable, but it is so seldom that they are so, that I feel some hesitation in recommending them; if they are bound on too tight, of course much mischief and inconvenience arises; and if not sufficiently tight, they will of course come undone. When I require bandages for exercise, I have them made from the blanketing used for clothing, as it wears much longer than the common serge, is softer, and affords more protection.

When the exercise of lounging is about to commence, the colt should always be at first set off to work to the right hand, so that, in case he breaks out of the trot, he may lead with the off leg, and although it is necessary that he be changed and lounged both ways, it is desirable, if either prevails, that it should be that of working him to the right; this, however, is very often reversed.

The pace at which colts are lounged is usually too fast; they are often not only hurried into a

canter, but absolutely into a gallop, although a trot is the proper pace, and should never be exceeded. It is a very general practice never to take colts on any but the most level surfaces; thus they never attain the fair use of their limbs, unless, at a future period, they are ridden as hunters or hacks, when they have a vast deal to learn. Hence, too, so much time and patience is required to make riding horses of those which have been in training. This was more conspicuous some five-and-twenty years ago, when a horse in training was never accustomed to more than three paces, —a walk, canter, and gallop, —than at the present period. The very idea of his trotting was then quite out of the question; now, however, many trainers adopt that pace from which two most important results arise; in the first place, it brings muscles into action which are not employed by any other motion, and in the second, it renders him more serviceable if, in thee vent of his powers not being adapted for racing, he is consigned to other purposes. I can speak from practical experience of the trouble required in making hunters of some horses that had been two or three years in training. I remember one in particular, which, before I purchased him, had been a season in Leicestershire, in the hands of a very superior performer, but never having been accus-

tomed to anything of the kind, had no idea of crossing ridge and furrow, and as to jumping, with a determined man on his back, he certainly did get over or through "somehow." Soon after he came into my possession I discovered his failings; he was a horse with very lengthy action, and never having been required "to break his stride," had no idea of doing so, or, in other words, reducing its extent to accommodate himself to the lands he was passing over, or of collecting himself to jump fences. As he was endowed with an excellent temper, I set about teaching him a better style of galloping and fencing; and for this trouble I was amply repaid. The improvement was accomplished by lounging him on uneven ground, over little open drains in meadows, and over small fences. I rode him till after Christmas in a provincial country, when I went to Melton. The first day I was out upon him, he was recognised by a gentleman who had seen him previously, and who mentioned the circumstance, at the same time observing, "He cannot go here, he has not got the step to get over ridge and furrow." My reply was, "When I purchased him he certainly had not, but I think you will find he has acquired it; watch him going over two or three of these fields," which happened to be admirably adapted for the purpose, one of them being a watered meadow intersected with small furrows. My

friend admitted that the horse's performance and activity were perfect.

All horses calculated to make hunters or steeple-chasers, should be taught while under the surveillance of the breaking tackle, to leap small fences; there is no necessity for practising them over dangerous places, or where the ground is hard; but low hedges or stiles, open ditches, and narrow water courses, may always be selected for their tuition. It appears almost unnecessary to observe, that the reins attached to the bit should be lengthened to an extent capable of affording the colt sufficient liberty.

The dumb jockey is an apparatus which finds favour in the opinion of most persons having the direction and management of young horses, and is no doubt a very useful agent, especially before the living rider is put up; but great caution must be used that the animal is not alarmed on the first introduction of what must appear to the astonished creature a wonderful production, if not an unwelcome companion. These inventions are usually made with soft pads at the lower branches to protect the back of the colt from injury; if, however, they are not so provided, a saddle becomes necessary; and that appendage must likewise be placed on the back in due course of time, whether it be intended as a seat for the dumb jockey or not; at any rate, the young animal should be perfectly

accustomed to it before any attempt is made to put a rider up.

The dumb jockey is provided with two adjustments on each side for the reins, designed for the purpose of regulating the position of the head: thus, if the horse carries his head too high, the lower reins are to be brought into action, and if the reverse, the upper ones; the carriage of the colt may be very materially altered by this means. When sufficiently accustomed to it, the dumb jockey may be left on two or three hours while the colt is by himself, either in a large loose box or in a small paddock. This will very materially improve his mouth, and as an auxiliary, a palate or slabbering bit may be introduced instead of the snaffle already mentioned. It is made with a straight mouth-piece, having three moveable ports or arches, all of which may be adjusted so as to hang down, or two may be allowed to hang in that position, and one placed upwards, in case the horse does not play upon them sufficiently without. This bit possesses one very great recommendation, that of creating an even mouth, and is the best remedy for correcting that defect sometimes occasioned by the common breaking-snaffle. A crouper may be attached to the dumb jockey with good effect, and eventually some loose straps runing through it, to fall over the loins and down the sides, especially with such horses as are intended

for harness; in fact, they should be accustomed by degrees to all sorts of appendages. Pocket-handkerchiefs may be tied to the upper branches of the dumb jockey, a hat placed upon it, and other similar devices patiently and gently introduced: by these practices much future trouble and many accidents will be avoided. The greatest caution must, however, be observed not to alarm the animal, or the object will be defeated.

What must be the amazement of young animals when they are for the first time mounted? If they had but the power of expressing their wonder, their story would no doubt be entertaining. Fear would, I apprehend, form a considerable portion of it. Hence this ceremony should therefore be performed with the utmost caution, patience, and quietude; and a boy should be put up and taken down again several times before any attempt is made for the animal to be ridden. This is a new era in his life; at first he may be disposed to free himself from the familiar intrusion of his companion, failing in which, he finds his actions more than ever controlled and restrained; and if inclined to be of a sullen temper, he will show it. This is a crisis most peculiarly calculated to call forth the skill, patience, and firmness of the colt-breaker, or if I may be allowed the expression, the colt's tutor. Much of the disposition which

characterises the horse in after-life may be established at an early age. The seeds of rebellion, obstinacy, and vice are as readily sown, and like noxious weeds, more likely to thrive than those of obedience, docility, and faithfulness. When the colt has been accustomed to having a boy put on his back, and taken down again, and submits to it quietly, it becomes necessary to teach him to move forward with the rider on his back. The latter, although he has the reins in his hands, should leave the guidance of the animal entirely to the assistant, by means of the lounging rein. I prefer a boy who can ride well to a man for the first probation, because he is lighter; and the man of experience is of more use on these occasions on foot, to lead the colt about, and lounge him with the rider up. When sufficiently reconciled, the rider endeavours to guide the colt by the reins, turning him at first slightly from right to left, and eventually turning him round. When these preliminary exercises have been acquired, it may be necessary to put up a horseman of greater experience, and possessing that rare attribute, hands; because it may now be supposed that the colt is sufficiently taught to be ridden about without the attendance of a person on foot, while the rider has the lounge rein coiled up in his left hand, which, in the event of being dislodged from his saddle, enables him to prevent his charge from

getting loose. The bridle best adapted for use at this period is the plain snaffle, with two reins, one of which passes through a martingale.

So much of the horse's appearance and carriage depends upon the way in which his mouth is formed, and the manner in which he is first ridden; and the future comfort and safety of those who may have the riding of him eventually, being so intimately blended therewith, it would be a great omission to neglect any observations calculated to perfect this part of his tuition. As a preliminary, many of the ordinary colt-breakers make a practice of rendering a colt's mouth sore, in order to effect its sensibility. But this is a most mistaken as well as cruel custom. There can be no doubt that during the time it is sore it is very sensitive, but when the healing process is completed, a more callous condition ensues. In the sore state the animal is afraid to face the bit, and in consequence frequently contracts a habit of rearing, the most dangerous vice in a horse. If the treatment which has been suggested be patiently and carefully carried out, there will seldom, if ever, be any occasion to complain of the want of sensibility in the mouth, or tractability in the animal. When, from neglect or want of attention on the first occasion of the colt being bitted and the reins put on, especially if they are drawn too tight, he contracts a habit of

hanging on the bit without champing, and playing with it so as to produce moisture or saliva; then it is that the foundation of a dead, insensible mouth is established, which requires much trouble to correct.

The reins usually used with a snaffle-bit, independently of those already mentioned, namely, the spare reins and martingale, are running reins, in which case the martingale is dispensed with. If properly handled, these, which I am about to describe, are very effective. They are arranged in two ways; the one, having a strap fixed to the girth like a martingale, is divided at about two feet eight inches from the lower end, so as to form two reins; these pass through the rings of the snaffle, and come up to the hand, using a buckle to connect them, like any other reins; with this tackle, if a horse is disposed to carry his head too high, it may be brought to the required position. Some persons buckle the martingale to the rings of the bit, but it is a practice that cannot be too strongly reprobated. The other plan is that of fastening the reins to the girth-strap, and passing them through the rings of the snaffle. They come up to the hand in a similar manner to what I have already described. They will not bring a horse's head down so effectually as the first named, but they have an excellent effect in causing a horse that carries his head in a tolerably good place, to bend

himself, and they afford great power to the rider; but they require nice handling.

I am a decided advocate for all young horses, especially those which are intended for hunters, hacks, or carriage work, being occasionally ridden with curb-bits, that is, after their education has been sufficiently matured with the snaffle. It renders them handy and improves their action, presuming, of course, that the bridle is properly made use of. There is an excellent kind of curb with which the late Lord George Bentinck was in the habit of riding his hacks, and every one will acknowledge there never was a better judge of such matters. I know not whether his lordship invented it, but it goes by his name among those who are acquainted with it. Many saddlers are quite ignorant of its existence, but it may be obtained from Mr. Heavens, 28, South Molton Street, Oxford Street. It has a moveable arch or high port, with a smaller port to act as a stop when the former is put up; the cheeks or sides are moveable on the mouth-piece. When the arch or port is turned up, it has a powerful effect on the roof of the mouth, especially with the auxiliary of a nose-band, an appendage which should always accompany its use when so disposed, though not essentially necessary when the arch is turned down. In the latter case it has a most excellent effect in keeping a horse's mouth from becoming

dead. John Day told me that the young horses at Danebury were all occasionally ridden with one; and that any colt, however dead and insensible his mouth might be, was soon brought into a state of subjection by the use of it. I can also mention a particular instance of the efficacy of this bit. I met a gentleman very recently who was riding a horse with the hounds; the animal had a mouth as insensible as a piece of iron, and my friend was not only in a most uncomfortable, but even in a dangerous predicament. I offered to lend him one of these bridles, which I was led to believe would answer his purpose; he expressed himself incredulous, nevertheless he sent for it and tried it, when to his great astonishment, and still greater satisfaction, he found his horse went admirably in it, and lost no time in procuring the facsimile. He has since informed me he had tried all sorts of bits and devices, but none had any good effect but this. From its peculiar construction it may be rendered severe or the reverse; but in neither case has it the effect of deadening the mouth; the great imperfection of many other bits. The *acmé* of perfection of a horse's mouth is to go pleasantly in a snaffle-bridle. To accomplish this he should be occasionally ridden, when young, in a bit such as I have described in order to make him handy. There are four distinct circumstances upon which it depends,

whether a horse will ride pleasantly in a snaffle-bridle, — his temper, the sensibility of his mouth, the way in which his head is put on, and the hands of the rider. So much depends upon the latter, that a horse which will go pleasantly with one man using one kind of bridle will not go at all with some others unless they change the tackle. One reason why many persons condemn snaffle-bridles, especially for hunters, is, because they have the head-piece buckled too short, by which the bit is drawn up to the angle of the lips causing the mouth to become dead, instead of allowing it to rest on the bars. I must confess I have no objection to a martingale for a hunter, providing there are spare reins to it, but not without, and the neck strap should be fastened to the D's of the saddle like a breast-plate, to prevent it from getting on the horse's head, in case of a fall. For anxious horses that have a trick of opening their mouths and hanging on the bit, a nose-band is an admirable contrivance. It is usually applied with a curb-bridle, but it has often a good effect with a snaffle: of course it must be buckled sufficiently tight, otherwise it is of no use.

The Pelham is a bit which I never much fancied: it is a species of hybrid between a curb and a snaffle, and most horses that will ride well in one will go equally well in a snaffle, but having two

reins gives some persons rather more confidence. Pelhams are very liable to make horses lean upon the arms of their riders. They are, however, very seldom used in the process of breaking, hence it is not on this occasion necessary to enter more fully on their merits or defects.

There is also a bridle occasionally used which I never could appreciate,—it is the gag. I never rode with one but once, and that was in a race. I inquired from the trainer why he put it on; his reply was, "You will find he will get his head down and break away with you unless you make use of it." I tied the reins up, but never touched them; he did not get his head down, neither did he attempt to run away; but he won his maiden race; and, with ordinary handling, I am quite certain no such apparatus was at all necessary with him. As the gag has the effect of drawing the snaffle up to the angle of the lips, a position in which it never ought to be placed if the rider desires to maintain power and control over the animal's mouth, I cannot conceive upon what principle such an apparatus can be advocated. It is generally supposed to be an antidote for a horse having learnt the trick of getting his head down, and then running away or attempting to do so. The remedy for this is, to raise the hands moderately, and slightly draw the bit across his mouth; but, with the gag, that cannot

be done, because drawing the reins in a manner which would have that effect with the common snaffle, will only draw the gag tighter into the angle of the lips, in which position, as I have already remarked, it is useless.

The kind of instinct — the reason, it may almost be termed, with which horses are gifted—will guide any contemplative mind in the management of particular animals under every variety of circumstances. If a horse, by rearing, kicking, or plunging, contrives to dislodge his rider, he dispossesses himself of a companion who may alarm or annoy him, and gives himself temporary liberty, which pleases him; and having done so once, he attempts it again, and success may very probably render him dangerous. From this cause it is important to employ skilful persons in the tuition of young animals. When horses are refractory, the state of things may be compared to the instinct of the brute opposed to the reasoning of the man, and the winner will be he who is most talented. A horse becoming alarmed, and in bad hands, is often beaten for it; fear is thus succeeded by punishment, and on the next occasion when any thing occurs to frighten him, he probably becomes refractory. In that case the instinct of the horse predominates over the reason of the man.

CHAP. IX.

PHYSIC.

Physic after Weaning. — Strong Doses deprecated. — Physic to Yearlings. — Symptoms which indicate the Necessity for Physic. — Preparation. — Time of giving Physic. — Water an Auxiliary. — Administering Balls. — Worms. — How they are nourished. — How they are detected. — Remedies for their Expulsion. — Table of the Proportions of Medicines to be given to Horses. — Formula for Aloetic Purgatives. — Time of giving Physic. — Formula for Alteratives. — Remarks.

AFTER being deprived of its mother's milk, the liver of the foal is very liable to assume an inactive, torpid condition; hence the great advantage of aloetic purgatives, which are supposed to act primarily on that organ. By the exhibition of a purgative the stomach is relieved, whereby the progress of chymification is assisted, an event of importance, considering that the young animal now becomes entirely dependent on a more stimulating food, calling into action more energy and vigour from the digestive faculties; the bowels are also stimulated to action by mild doses of physic, and chylification, another process most es-

sential to the vigorous health of the animal, is more perfectly accomplished. The nourishment of the body being finally supplied by the agency of these two fluids, it is of vast importance that the reservoirs in which they are secreted and from which they are conveyed, should be in a healthy and powerful condition.

As a general practice it may be laid down, that foals should have a mild dose of physic, the quantity to be regulated by circumstances, about a fortnight or three weeks after they are weaned, to be succeeded by a second after an interval of ten or twelve days. The first dose, unless for a very early, hardy, and powerful foal, should not exceed one drachm of aloes, with corresponding portions of the other ingredients, for which a formula is here given: an extra scruple may be administered on the second occasion, if found necessary, but it should be remarked that violent purging is not to be desired, on the contrary, it is very injurious. How the horses in former days endured the violent doses which were given to them it is difficult to understand, unless the aloes were adulterated, or, from some cause in their preparation, were less powerful. From old formulæ it may be discovered that eight and ten drachms of Barbadoes aloes, was the usual dose to a horse of mature age. That they were a long time in re-

covering from the effects there is no doubt, and that they were occasionally destroyed by such treatment is pretty certain. If the dose is sufficiently powerful to purge the animal, that is all that ought to be effected. It must also be observed that it is not always the most gross feeder that requires the largest proportion of aloes; such animals are often characterised by relaxation of the bowels, which are, in consequence, readily acted upon; while light feeders will often be troubled with costiveness and constipation, and, being generally less disposed to consume any considerable quantity of bran-mash, their bowels are less susceptible of the influence of aperients. Yearlings likewise require two doses of physic during the month of April, to prepare them for the change of atmosphere and diet; and, in fact, all horses of a more mature age, that are kept upon good and nourishing food, require physic in the spring and autumn. It may be observed, why not give them their food in more sparing quantities, and of a less nutritive quality, and so dispense with the physic? The reply is obvious; because when kept upon a poor diet, the vigorous growth of their bodies, and the development of their muscles, cannot be acquired by that means, as is daily proved by those which are so treated.

The necessity for physic between the periods

already mentioned, must be dictated by circumstances. The symptoms which indicate that necessity, it is presumed, ought to be familiar to most persons conversant with the management of horses. Any accident, for example, such as a blow or wound, which interdicts the propriety or practicability of exercise, and by which local inflammation is excited, is an occasion for resorting to physic. Here, however, it may be desirable to direct attention to a distinction between some symptoms which are apt to mislead, originating, as they do in extreme cases of debility and plethora, respectively. In a state of debility, for instance, the legs will often swell from want of energy in the circulation, the vessels with which the extremities are supplied being surcharged. This is the result, usually, of some previous indisposition, such as influenza, strangles, bad or repeated colds; and in this state the absorbent vessels become so languid as not to be able to perform their offices. Strong doses of purgative medicines are then extremely prejudicial, by increasing the debility; and tonics, with mild diuretics, are to be preferred. Discretion, it will therefore be seen, is necessary, when swelled legs are discovered, to distinguish between the two opposite causes from which they have arisen; and I introduce these remarks simply for the purpose of

pointing out the fact that swelled legs are not invariably to be attributed to a plethoric habit.

The effect of purgative medicine depends so much upon the preparation which the animal has undergone, that a few hints on that important subject may not be out of place. I have on all occasions witnessed exceedingly favourable results from mild doses of physic, when the animals to which they have been administered have previously been subjected to a proper preparation; while I can bear strong testimony to the bad effects which strong doses, supposed to be necessary to obtain the purgative result, have frequently produced. Horses, when they are partaking of grass or succulent food of that nature, are more readily purged than when living entirely upon hay and corn; the quantity of aloes, therefore, requires to be regulated accordingly. There is no danger whatever to be apprehended from giving them physic when eating green herbage, the usual precautions against their taking cold being of course adopted. In preparing horses for physic, no food of any kind should be given except bran-mashes, to which a portion of corn may be added during the twenty-four hours prior to the ball being given. It is a prevailing custom to give physic in the morning, but from four to five in the afternoon is a more convenient time, as in that case it will, or ought to, act upon the bowels on

the following morning between nine and ten o'clock, at which period the subject should be led or ridden out, to assist the operation of the medicine; chilled water is to be presented in furtherance of the same object. It is also advisable to offer the animal water immediately before the ball is given, although this regulation is very commonly reversed. Attention to the habits and propensities of the equine tribe will explain the motives for this direction. If the water be presented subsequently to the ball having been given, the animal will very probably refuse to drink any, especially after having had a few doses of physic. On the following morning a degree of nausea will exist, and the aversion to water will still continue: thus, the very great assistance which the medicine would receive in its operation from that fluid, properly managed, is lost; or what is worse, just as the physic has nearly done its duty, thirst prevails, at which crisis it would be injurious to give water unless in a very small quantity, otherwise, a second action of the bowels may be excited, very incompatible with the salutary effects intended to be produced.

The rude manner too often resorted to in giving balls to horses cannot be too strongly condemned; the cruelty exercised, and the natural dread thereby occasioned, frequently creating a difficulty in future. The violent manner in which some men

will foolishly grasp the tongue, and the severity used in attempting to hold the animal, cause pain which the poor creature assuredly resists. The use of the balling-iron should be on all occasions positively interdicted. The assistant should place his right hand on the nose of the horse in such a manner as not to press on the soft portion or cartilage, and thereby interrupt the breathing; he then inserts his thumb on the bars, and, with two fingers placed on the lower jaw, opens the mouth, which being performed with tenderness, will not create alarm or confusion. The operator having his right hand defended by a glove, the two forefingers of which have been cut off, places the ball between those fingers, keeping his hand as flat as possible, not with his knuckles arched, a foolish, bad custom; then, by taking hold of the tongue very gently with his left hand, he draws it out of the mouth as far as he conveniently can without causing pain, when, by inserting the ball on the root of the tongue, he quickly withdraws his hand, and immediately shutting the horse's mouth, the ball will be swallowed without trouble. Old horses that have been frequently tortured by ruffianly treatment, are naturally much averse to the operation, but this arises entirely from previous ill usage.

Whenever any of the young stock, or in fact, any other horse, evinces symptoms of indisposition,

by loss of appetite, dulness of spirits, or swelling of the legs (unless debility is indicated, as the cause of the last named), a mild dose of physic is generally the most successful remedy, unless it appears that some specific complaint exists, in which the advice of an experienced professor of the veterinary art will most probably be required. With that science I will not presume to interfere, contenting myself by only offering suggestions by way of prophylactics in such ordinary and every-day occurrences as every person who undertakes the management of a stud of horses must necessarily be required to be competent in directing.

Those offensive parasites, worms, are apt to be troublesome to horses at all ages; not unfrequently to foals, but more especially to yearlings. They often exist to an extensive degree for a considerable period before their presence is detected; but at length, the ravages they have committed on the constitution speak too plainly to admit of a doubt: and on this account, very frequent examinations of the evacuations should be made, not merely superficially, but by dividing the heaps with the stable-fork, or some similar implement. Without entering into the unprofitable inquiry how these insects come to life in the stomach and bowels of the equine tribe, it will be sufficient for our present purpose to show how they are fed. The very essence of the nourishment intended for the support

of the horse, after it has been extracted from the food, and while it remains in the stomach and bowels ready to be taken into the circulation by means of the vessels arranged for that purpose, is seized upon by these relentless vermin. Can it be a matter of surprise, therefore, that when they prevail in considerable numbers, a variety of bad symptoms should appear? It is well understood that sympathy exists between the stomach, and bowels, and the skin. The presence of worms may be detected by the appearance of the coat, which assumes a staring, harsh, and unthrifty character, and grows longer than natural, especially about the flank, where hairs of uncommon length often afford a peculiar indication. A light cream coloured powder is to be seen on the fundament. A dry harsh cough is frequently another symptom. Constipation of the bowels, succeeded by copious and sometimes uncontrollable purging, is at times produced by worms. The animal frequently consumes an immoderate quantity of food, becomes big-bellied, but loses flesh. With only a portion of these ailments, it is not to be wondered that a wasting of the muscle, or falling off in condition, as it is commonly termed, should be one of the most positive criterions, attended likewise with the most profuse perspiration from every trifling exertion. Not only do worms deprive young animals of a great portion of the

sustenance required to promote their growth and vigour, and thus produce temporary inconveniences, but, if suffered to continue, they establish a debilitated constitution, which no care or treatment hereafter can restore. Horses of a more mature age are rendered incapable of performing even a moderate share of work, in common cases required from them.

Various are the remedies prescribed for the removal of these intruders, some of which are more calculated to amuse the mind than to prove satisfactory; and if the worms possessed the faculty of knowing what extraordinary contrivances were contemplated for their destruction, they would no doubt join exultingly in the delusive jest. Savine, rue, and many productions of a vegetable kind, have been selected, none of which are to be relied upon. It has been remarked by a very able veterinary surgeon that, although we can force a poison down a horse's throat, we cannot compel the worms to receive it. This may, under certain circumstances, be true. If nauseous antidotes from either the vegetable or mineral kingdom be presented in the form of balls, instinct may direct the worms to repudiate the offer; but let us consider if, by a little tact and management, we cannot enchant the appetite, and entice these greedy gentry with a taste of some delicious potion, not unsavoury to their palates,

but provided for their especial ruin. There is no bird, beast, or insect within the reach of man, whose destruction he cannot compass if he sets his mind on accomplishing it.

The most satisfactory results will be obtained from the use of calomel or tartarized antimony. I should certainly award the preference to the former, if it were only from the circumstance of its possessing less taste than the latter; and, therefore, more certain to inveigle the worms into its power. With calomel, properly administered, there need be no apprehension that it will not succeed. The improper combination of it with other drugs may have caused it to fail, and led those who have been, from that circumstance, disappointed, to the belief that the medicine was not possessed of the power ascribed to it. It must be remarked that alkalies are incompatible with both calomel and tartarized antimony; neither of these drugs ought, therefore, to be given in balls mixed up with soap; nor should soap be a component part of any balls given with the intention of working off either of these medicines.

Before the time arrives when it is proposed to effect a dislodgment of worms, the patient should be subjected to abstinence from any kind of food during the term of six or eight hours at the least, by which means the appetites of the insects will become somewhat keen. A

small quantity of bran-mash is then to be given, with the portion of calomel or tartarized antimony well mixed therein, the relative proportions of which are hereafter specified, to be regulated according to the age of the animal. This dose being given at night or morning, is to be repeated either on the following morning or evening, so as to allow an interval of ten, or twelve hours between each; and during which time no other kind of food is to be offered than the bran-mashes, in which one or other of the drugs has been mixed. Six hours after the last mash, so prepared, has been given, it must be worked off with linseed oil or aloes. If the subject be a foal, some trouble is occasioned and skill is required in giving a ball; but I must confess a preference to that mode of presenting the purgative. I have always effected the administration of that compound by placing it on the end of a piece of whalebone or cane; care, tenderness, and dexterity are, however, required for the performance of the operation. It will be seen by this course of treatment, that the worms having no other kind of food to partake of but that which is impregnated with the calomel or tartarized antimony, have no alternative but to seize upon it when it comes within their reach; and the former drug being tasteless and very diffusible, there is little doubt but they will have a taste sufficient either to

destroy them, or cause them to lose their hold, when the purgative medicine clears them away.

The following tables will show the relative proportions of medicines which may be given to horses at different ages; preference to be awarded to the smaller quantities, unless under peculiar circumstances.

	Calomel or tartarized Antimony. grs.	Linseed Oil. ozs.	Aloes. drachms.
To foals	10	4 to 6	½ to ⅔
Yearlings	15 to 20	6 to 8	1 to 1½
Two year olds	20 to 25	8 to 12	2 to 2½
Three year olds	25 to 30	12 to 15	2½ to 3½
Four year olds and upwards	30 to 60	1 to 2 pts.	4 to 6

Formula for aloetic purgative.

Aloes, finely powdered	4 drachms.
Hard soap	2 drachms.
Ginger, in powder	2 drachms.

Mix and form a ball, varying the proportions according to circumstances.

Formula for an aloetic purgative when soap is an incompatible ingredient, as with calomel or tartarized antimony.

Aloes, broken in pieces	4 drachms.
Olive oil or lard	1 drachm.
Ginger, in powder	2 drachms.
Treacle	1½ drachm.

The aloes and oil, or lard, are to be melted together, which is most readily accomplished by putting them in a jar, and placing it in a saucepan containing a small portion of water over the fire; when melted, the treacle must be added, and also the ginger, stirring it well together, and beating it into a mass. Care should be taken not to boil the aloes longer than to effect the solution, otherwise much of their purgative property will escape. When sufficiently cool, form a ball, varying the proportions according to the strength required. Many persons use the latter as the ordinary purgative for the horse; I must, however, observe that I prefer the first in all cases where soap is not objectionable, because it works more readily. If the horse is properly prepared, and the ball be given about four in the afternoon, the operation may be expected to commence about nine or ten o'clock on the following morning, when, the stable door being opened, the effects can be watched, and the necessary walking exercise given. It must be observed that the only periods when any inconvenience is at all likely to result from physic, is at the times when the medicine first begins to operate on the intestines; and at the crisis when those effects are terminating, or, in stable language, when it is about to set; but as these symptoms arise from the circumstance of the bowels being distended with

hay, or from exposure to cold, they never need be anticipated if proper treatment has been observed. I have given many hundreds of doses of physic according to the first formula, and never experienced a case of gripes or colic in my life. Should such an event happen, a drench composed of warm ale, with a tea-spoonful of ginger or from two to four drachms, half that quantity of allspice, or black pepper, and a wine-glassful of gin, may reasonably be expected to afford relief. On this account, hay should only be offered in sparing quantities when the physic has nearly performed its operations.

As an alterative, when a strong purgative is not required, very beneficial effects are produced from aloes and nitre in combination. The subjoined is a formula for a horse that has arrived at maturity; it must of course be modified for younger animals. It is to be given daily until relaxation of the bowels is produced, which will generally take place after the second or third dose.

Formula for aloetic alteratives.

Aloes, in fine powder - -	2 drachms.
Nitre - - - - -	2 drachms.
Soap - - - - -	2 drachms.

To make one ball.

Not being an advocate for what are generally denominated alteratives, in most cases, compounded with antimonials, I do not by any means recommend them to be used unless there are circumstances which positively require them, — such as eruptions on the skin, — for which purpose the following is the most simple. It should be made into a ball, rather than given in the corn, the great objection to which is, that many horses refuse to eat it. Nitre should, at the same time, be given in the water, to the amount of two drachms daily. It is here necessary to remark that when nitre is intended to act as a diuretic, it should be given in solution; when given as a febrifuge, in a ball, in which case the solution taking place in the stomach, its refrigerant properties are brought into effect.

Antimonial alterative.

Sulphur,
Sesqui-sulphuret of antimony, each - 2 to 3 drachms.
Treacle, sufficient to form a mass.

In order to derive any benefit from these alteratives, they are to be given daily, four, five, or six days in succession. These proportions are adapted for three years old or upwards, before which time they can scarcely, if ever, be required.

Judiciously dispensed, physic is of the greatest importance to the horse. The abuse of the best

remedies may bring them into disrepute; but in those cases it is not the remedy which deserves the condemnation, but the person who uses it indiscreetly. The improper use of diuretics more generally prevails in stables than that of any other kind of medicine. Nothing can be more pernicious to the constitution than a constant repetition of those drugs which excite the kidneys and other parts of the urinary system. From two to four drachms of nitre occasionally dissolved in the water may be given with good effect; but not repeated daily unless there is some indisposition that requires it.

CHAP. X.

SHOEING.

Diversity of Opinions — Accounted for. — Difference of Shoes and Treatment to be regulated by the Nature of the Feet and the Country or Purpose for which the Animal is used. — Importance of stopping the Feet. — A Shoe with a wide Web necessary in Stony and Flinty Districts, but not recommended otherwise. — Removing. — One-side Nailing. — Expansion of the Foot. — Position of the Navicular Bone and other Parts of the Foot. — Altered Structure occasioned sometimes by Accident. — Kind of Shoe best adapted for Young Stock. — Time when Shoes become necessary. — Stopping the Feet of Great Importance.

SUCH a diversity of opinions are held on this subject by different persons, that it is extremely difficult to offer any satisfactory suggestions in regard to it. We have only to deal with it in reference to young stock; but as there have been so many treatises written concerning the best methods of adapting shoes to the feet of horses, most of which differ from one other, I will endeavour to show how such discrepancies have arisen, and prove that, in most cases, each is correct from his own deductions and personal experience.

A man living in a rough, stony, or flinty district

declares that it is essentially necessary to afford protection to the foot by means of shoes with considerable width of web, or, as it is technically termed, plenty of cover. Another, living in a grass country, where stones and flints are never seen, except upon the roads, which are so good and level that no angular or dangerous projections exist, deprecates the width of web, because, as he justly states, it deprives the feet in a great measure of the support and pressure obtainable from the yielding surface upon which the horse moves. Now, both these opinions are correct; but they are only correct under local influences. Nature has endowed the foot of the horse with every faculty which it requires in a wild state; but it is not of a texture sufficiently durable to withstand the effects of artificial roads, or of galloping over fields and leaping fences, with some ten or fifteen stone weight upon the back of the animal. Man has, therefore, resorted to the alternative of affording protection to the feet by means of shoes, from which advantages are gained in some respects, and evils introduced in others. In a state of nature, unless the soil on which the horse treads is very dry and hard, the feet make an impression on the surface, and the weight of the body is apportioned between the wall, the sole, and the frog; when shod, and travelling upon a hard surface such as a turnpike road, or dry, unyielding turf,

the whole of the weight is sustained by the wall or crust resting on the shoe. It is to obviate this that, having adopted the artificial iron appendage, we should likewise provide an artificial succedaneum for that of which the shoe deprives the animal, namely, the uniform bearing of the foot upon the ground; and this is of the greater importance in those cases where it is absolutely necessary to use shoes with a wide web. It is not only when passing over hard and unyielding surfaces that this condition is apparent, but also, to a very considerable extent, when the horse is in the stable. In that situation likewise, the wider the web of the shoe, the more will the evil predominate. I do not mean to assert that, in a stony or flinty district, especially on rough roads, a shoe with a considerable portion of cover can be dispensed with; but I certainly should never adopt that practice unless under those circumstances, or for peculiarly thin, flat feet, which must be protected. There are some feet whose soles are so very thin and soft, and whose growth is so sluggish, that, unless they are shod with plenty of cover, the horses cannot travel at all; when fresh shod, such feet scarcely admit of any paring.

The feet of some horses secrete sole and hoof so very fast as to require their shoes to be removed every fortnight or three weeks, at the farthest, when the soles require to be considerably reduced,

and the quarters rasped, especially during the summer, at which season they become dry and hard. If this precaution be neglected, the inelastic state of the external portions of the foot, affording too much resistance, and causing concussion, inflammation of the internal parts ensues, and lameness is the result. Such feet are kept in the most healthy condition by the least proportion of cover, unless the nature of the country in which they are located peremptorily demands it. If they have to travel on roads abounding with loose materials, such as broken granite, flints, or rough gravel, they will be apt to bruise their feet whenever a stone happens to lie in their track, if not protected by their shoes.

The system of one side nailing has its advocates, in whose ranks, however, I must beg to decline enrolling myself. For road work, either under the saddle or in harness, I have no doubt the shoes *may* be kept on; but for race-horses in their work, or hunters in a deep country, where at every step they take there is a power of suction to contend against, I am quite of opinion that when only the inner branch of the shoe is secured to the foot with nails, from the great power of leverage afforded, the loss of a shoe will be a frequent result.

Neither can I believe that the expansion of the foot extends anteriorly beyond the widest part

of its circumference, behind which the heel nails ought not to be placed. An examination of its internal structure certainly leads to this conviction. The coffin bone, for example, does not expand in itself, and being wider at its base than it is upwards, cannot produce lateral expansion of the hoof; behind, but somewhat above that, is placed the navicular bone, passing which, the lower extremity of the flexor tendon comes to its position at the hinder part of the coffin bone, just under the navicular bone. Partly behind and partly underneath the tendon is the internal frog, a substance previously mentioned, when alluding to thrushes, as partaking of a nature between fat and tendon, which, in a healthy condition, is highly elastic, and about the region of which expansion is undoubtedly required. The hoof offers another proof: the front part and sides, as far as the widest portion extends, is very strong, and nearly, if not quite, unyielding; but the quarters are much thinner, and more capable of expansion. Thus, finding there is no power of expansion extending throughout from the toe to the heel, but only from the centre of the foot, or widest part, to the heel, the one-sided nailing system can only afford greater power of expansion to the inside quarter where there are no nails, still acting on the outside quarter in

precisely the same way that the ordinary arrangement of the nails does; with possibly this disadvantage, that the outside heel nail is often placed rather farther back than on ordinary occasions, for the purpose of affording greater security to the shoe.

Some persons are of opinion that the structure of the foot is completely altered by a repetition of shoeing. When such an event takes place, it is evidence incontrovertible, that the principle of shoeing which they adopt, and the treatment which they observe, is erroneous; because the structure is not changed if the system of shoeing be good, and the treatment correct. Indications of altered structure may also arise from a predisposition to disease having been established by accident, and not counteracted by observation and appropriate remedies.

As the feet of young horses ought not to be subjected to the injurious effects of rough and stony roads, it is unnecessary, and quite unadvisable, to put on shoes wide in the web,—at all events, at first. The only consideration necessary is the protection of the crust from breaking off or wearing away. The less cover to the foot the better, unless, as I have previously remarked, there are some peculiar circumstances which require it. The best description of shoes adapted for young stock, that ever came to my notice,

are those formed by steam machinery, by Mr. Rodway, of Birmingham.

The time when a young horse is to be shod must depend upon the progress that has been made in his breaking, and the nature or condition of his feet: if they be in any way delicate, it will be necessary to protect them somewhat earlier, otherwise it may be deferred nearly to the time of his being backed. If the suggestions which I have already made have been carried into execution, no difficulty will arise in putting on a set of shoes.

For the purpose of affording to the centre of the foot a degree of support and pressure similar to that which it obtains before the shoes are put on, a pad of tow should be placed within the fore-shoes, and secured there with splints of wood. This may be saturated with water or not, as circumstances and the nature of the feet require. It is by far the best kind of stopping that can be used, and may be applied in any degree of thickness requisite for expansion and other special purposes. Cowdung and clay, or cowdung alone, is the usual offensive compound employed to keep the feet moist; but the corrosive properties will often occasion thrushes, and no support can be derived from it, as it is far too soft for that purpose; and there is no period when that artificial support is of more importance than to the *newly* shod colt.

CHAP. XI.

CULTIVATION AND MANAGEMENT OF LAND.

The Elements of Nutriment derived from the Earth. — The Effect of Soil, Situation, and Culture. — Draining in most Cases essential. — An Example on light Land. — Draining Tiles. — Cultivation of Lucerne: Manure best calculated to promote its Growth. — Tares. — Clover. — Saintfoin. — Liquid Manure and its Application. — Value of Manure made by Horses. — Caution respecting Artificial Manures. — Guano. — Supply of Green Food in Summer. — Haymaking. — Salt. — The Produce of Meadows. — Capabilities of Land for the Production of Hay. — Improvement of Grass on Downs and Commons. — Swedes preferable to Carrots.

As a living animal derives the elements of nourishment from the food which he eats, and is consequently dependent for his state upon the qualities of that food, so vegetation partakes of properties which it obtains from the soil on which it is produced. The fine sweet herbage which grows spontaneously on downs and elevated tracts of land, if transplanted to wet and boggy marshes, would soon become harsh, coarse, and sour, like other grasses indigenous to the soil. There are some situations and some descriptions of land which are not adapted at all for the cultivation of

food to be consumed by horses; many others which are naturally so; and some which are capable of being made so by artificial means and proper management, the basis of which is draining. There is very little land, indeed, which is not improved by this process,—even that which is dry. It is a mistake to suppose that draining will be the means of causing dry lands to burn up in the hot weather of summer, when there is no water to pass through the drains. On the contrary, draining a very porous soil improves it by taking the water off laterally, underneath the surface, which otherwise descends perpendicularly, and by so doing conveys the vegetative powers of the manures which may be applied below the range of the roots of whatever grain or grasses may be sown. I remember, twenty years ago, a most striking instance of this kind on a farm in Shropshire, on which, previously to its being drained, manuring it was waste of money. It is light sandy land, and many farmers were of opinion at the time that draining it would render it even less productive. The result was most satisfactory. That all lands of a wet nature require draining, no one with the least knowledge of agricultural affairs ever entertains the slightest doubt. It is the fundamental principle of good farming; and, for lands upon which food for horses is to be raised, it is indispensable. Here it is necessary to intro-

duce a caution against the adoption of the small pipe tiles, now so often used for this purpose, the diameter of which is in many cases insufficient to conduct the water; and if in laying them down the least irregularity arises, which cannot always be detected, or prevented, so that the ends of the tiles do not meet precisely, the space for the water is still more contracted, and several instances have occurred where it has been found necessary to take up a whole length of drain to rectify the mischief, at a cost nearly equivalent to the price of the tiles. As draining should be considered a permanent improvement, great attention should be bestowed upon it, so that it be done effectually and well in the first instance.

The cultivation of lucerne demands the first attention, not only because of its being the best description of summer food for brood mares, but when once established it will endure for several years. It requires a dry and somewhat deep soil, as the roots penetrate to a considerable extent; on wet or clay lands it will not succeed. The spot on which it is to be sown should be made most scrupulously clean; and here I would advise all farmers to weed and clean their hedge-rows every year, if they desire to have their fields and crops free from the seeds which too frequently appear to be cultivated in the fences for the purpose of causing future trouble. A good

dressing of thoroughly reduced manure should be worked into the land previously to sowing it; for it may be taken as an established rule that the soil cannot be too rich for lucerne. From the latter end of March up to the last week of April is the best period for consigning the seeds to the ground. Lucerne may be sown broadcast, or in drills nine inches apart; the latter is by far the most successful plan, as it admits of the use of the hoe between the rows during the first year or two, after which, if well attended to, it will become strong enough to overpower all weeds that could prove injurious. On some occasions the drills are set much wider apart, that is, from fifteen to eighteen inches, with a view to constant cultivation between the rows, But I am not prepared to recommend this practice, because, when cutting the crop in rainy weather, it is impossible to avoid collecting some of the loose earth with it, which is offensive and unwholesome. It requires a good dressing of manure every year, not with partially decomposed litter, but with that which is thoroughly reduced and worked into compost with earth, road scrapings, parings from banks, if free from weeds; vegetable refuse may also be added, provided it does not contain the germs of any extraneous rubbish which may vegetate. It is labour lost to clean land and afterwards introduce pernicious seeds in manures or dressings. When lucerne is sown, it is a common

practice to sow a crop of barley along with it; but in a stud farm the green crop is of far greater importance; in case a crop of barley is very strong and luxuriant, by becoming lodged it will infallibly destroy the young lucerne, which, if sown by itself, will admit of being cut the first year by the month of August.

If there be a sufficient quantity of lucerne cultivated, and a fair portion of grass land available, little else will be required for use as green food; otherwise, tares, clover, or saintfoin must be provided; but those artificial grasses do not require any particular system of cultivation.

The application of liquid manure to all artificial and permanent grasses claims particular attention; and that which is obtained from the dung-heap where horses are kept, is the most powerful of any. Tanks or reservoirs of ample size, for its reception, will therefore form an important feature in the management and economy of a stud farm. They should be so arranged as to be on the outside, and at some distance from the buildings, so that the effluvia may not affect the stock. By the aid of a water-cart constructed for the purpose, the crops may be saturated soon after they have been cut, selecting, if possible, showery weather to perform the operation, otherwise it may be necessary to dilute the liquid with water, especially if much evaporation has taken place,

as it is not desirable to present it to the plants in too concentrated a form. When dry weather prevails, and it is found necessary to use the liquid manure, an early hour in the morning, while the dew still remains, or even during the night season, are the most favourable times. By no means is the watering to be performed while the sun is shining powerfully on the earth. The benefit which the crops of green clover derive from this practice is extraordinary.

In the management of land connected with a stud farm, or indeed any other farm, it is an object of great importance to be able to obtain two or three cuttings of green crops during the summer, which can only be accomplished by the aid of manure and high cultivation. In the autumn, when all these crops have been mown for the last time, the land should be dressed with manure. It is far preferable at that time than to defer it till the winter; the crops will come up earlier — a great object — and stronger. If any be left till winter, let it be the old turf intended for hay.

There is no animal that produces such valuable manure as the horse, therefore there can be no excuse for not having the land in the best possible condition, and that without having recourse to artificial manures, unless at the first commencement, to establish flourishing crops.

With respect to artificial manures, however valuable some of them are for particular purposes, the indiscriminate use of them on all occasions, without ascertaining the properties of which they are composed, is a great evil; and no doubt can be entertained that the prevalence of various diseases in grain crops may be ascribed to the injudicious application of them. Mildew, redgum, and other disorders in wheat, proceed from an unwholesome condition of the pabulum, which it obtains from the earth, in some instances from the manure, or from an unfavourable state of the air, in a similar way that surfeits or epidemic diseases are produced in cattle by the food which they consume, or some peculiar influence of the atmosphere. It is therefore of the utmost importance that the food to be given to animals of value should be free, if possible, from any unwholesome properties.

Guano is so often mixed and adulterated, and therefore so varied in its effects, that no person can use it with confidence and satisfaction, without having it previously analysed to ascertain what elements it consists of, and in what proportions they exist. I should never think of using it on any land, the produce of which was to be consumed by horses.

The green crops intended for summer food should be mown early in the morning if the

weather be dry, and carted away to the paddocks, yards, boxes, &c., and there should not be more cut than will be consumed in the course of the day; but in rainy weather it is better kept till the day after it is cut, in which case it should be spread on the surface of a spare barn floor, loose box, or shed, so that it may not heat, which it will do if suffered to remain in a large heap, in which state it is unwholesome; neither is it desirable to give it when very wet, as it will then endanger flatulence, gripes, and purging.

Very great care and attention should be devoted to the process of hay making. I have already noticed the bad consequences which may be anticipated from the use of imperfectly or of overmade hay. A practice prevails in some countries of strewing salt on the rick as it is being formed, especially if rain has fallen during the time the hay is in the field: it may be very well for horned cattle, but for horses it cannot be too strongly deprecated. It is a very different affair to giving them fresh salt with their food, which is an excellent tonic if used with discretion. Salted meats are not the most wholesome kind of food for man, and salted hay for the horse is analogous.

If there be meadows by the side of a river, the produce of which is to be consumed by the stud, it will be preferable to give that in a green state

if possible, and reserve the upland turf for hay; the cultivation of which cannot be too sedulously attended to. Many agriculturists are sadly in error respecting the capabilities of land for growing hay; they fancy that many fields will not produce grass for a permanency, and consequently will not try the experiment. When grass grows spontaneously, it is a certain proof that abundant crops may be raised if the proper kinds of seeds be sown, and a sufficient quantity of top dressing applied. But their fault is, that they appropriate all their manure to their arable land, leaving the grass, which is the most profitable, without any. The short pastures found on downs and commons, constantly fed close by sheep, might soon be brought into a flourishing state by a plentiful application of manure.

As I cannot recommend the use of carrots for horses, it is unnecessary to offer any remarks respecting their cultivation. A few Swedes may be useful, and likewise parsnips, the culture of which requires no particular directions.

CHAP. XII.

FOOD, ITS PROPERTIES AND EFFECTS.

Effects of Food on the Growth of Animals. — M. Liebig's Researches. — Testimony to the Practical Truth of M. Liebig's Remarks. — The Nature of Food. — Muscular Development and other Animal Substance promoted by the Quality of Food. — Oxygen: its Effects. — The Practice of wetting Oats objectionable. — The Powers of Digestion. — The Gastric Juice. — Reasons for varying the Nature of Food in Winter and Summer. — Habits of the Natives of hot and cold Climates compared. — The Re-supply of Blood by Food necessary to Life. — Effects of over-stimulating Food. — The Growth of the Horse promoted by the Quality of the Food. — Boussingault's Analysis. — Criterion for Selection of Food for specific Purposes. — Comparative Nourishment derived from Grass and Hay. — Grass distends the Bowels and substitutes Fat for Muscle. — The unborn Foal partakes greatly the Condition of the Dam. — Suitable Food of the utmost Importance. — Sugar and Starch the Elements of Nutrition in Hay and Oats. — The Amount varies in different Samples. — The Kind of Hay best calculated for Horses. — Clover Hay. — Saintfoin Hay. — Old Hay. — Oats, their Qualities; dried on Kilns condemned. — Bruising Oats recommended. — Prejudice — Schemes adopted to induce Mastication. — Mastication. — Saliva. — Anecdote from Dr. Paris on Diet. — Deglutition. — Economy. — Beans. — Mashes. — Mucilage obtained therefrom. — Linseed. — To be boiled. — Effects produced by Carrots. — Grasses. — Economy and Advantages of mowing the Grasses and giving to the Stock in preference to grazing. — Kinds of Grasses determined by the Nature of the Soil. — Deductions.

THE best means of acquiring a knowledge of the properties which certain kinds of food possess, and

the effects which they produce on the system and development of growth in animals, is to consult those authors who have made such researches their particular study, compare the results of daily experience with the instruction they afford, and by that means readily decide what change or variety of food is required at certain seasons of the year, or by particular animals under peculiar influences. One of the prevailing causes of success or disappointment in the management of a horse depends upon the judicious or injudicious selection of his food, which we may say *en passant* frequently requires to be changed.

The lucid manner in which M. Liebig has treated this interesting subject, induces me to introduce a few of his observations, to enable the reader the more easily to understand the application we purpose to give them. After explaining the manner in which the growth of animal bodies is carried on, and the supply of nourishment necessary to sustain life, M. Liebig goes on to say, "If we hold that the increase of mass in the animal body, the development of its organs, and the supply of waste, that all is dependent on the blood, that is, the ingredients of the blood, then, only those substances can properly be called nutritious, or considered as food, which are capable of conversion into blood. To determine, therefore, what substances

are capable of affording nourishment, it is only necessary to ascertain the composition of the food, and to compare it with the ingredients of the blood."

"Two substances require especial consideration as the chief ingredients of the blood; one of these separates immediately from the blood when withdrawn from the circulation. It is well known that in this case blood coagulates and separates into a yellowish liquid the serum of the blood and gelatinous mass, which adheres to a rod or stick in soft elastic fibres when coagulating blood is briskly stirred. This is the fibrine of the blood, which is identical in all its properties with muscular fibre, when the latter is purified from all foreign matters."

"The second principal ingredient of the blood is contained in the serum, and gives to this liquid all the properties of the white of eggs, with which it is identical. When heated, it coagulates into a white elastic mass, and the coagulating substance is called albumen."

"Chemical analysis has led to the remarkable result, that fibrine and albumen contain the same organic elements united in the same proportion, so that two analyses, the one of fibrine, and the other of albumen, do not differ more than two analyses of fibrine, or two of albumen respectively do, in the composition of one hundred parts."

"Both albumen and fibrine in the process of nutrition are capable of being converted into muscular fibre, and muscular fibre is capable of being reconverted into blood. These facts have long been established by physiologists, and chemistry has merely proved that these metamorphoses can be accomplished under the influence of a certain force without the aid of a third substance, or of its elements, and without the addition of any foreign elements, or the separation of any element previously present in these substances."

"Those vegetable principles which in animals are used to form blood, contain the chief constituents of blood, fibrine and albumen, ready formed as regards their composition. All plants, besides, contain a certain quantity of iron, which reappears in the colouring matter of the blood. Vegetable fibrine and animal fibrine, vegetable albumen and animal albumen, hardly differ even in form. If these principles be wanting in the food, the nutrition of the animal is arrested; and when they are present, the graminivorous animal obtains in its food the very same principles, on the presence of which the nutrition of the carnivora entirely depends."

"From what has been said it follows that the development of the animal organism, and its growth, are dependent on the reception of certain

principles identical with the chief constituents of the blood."

M. Liebig also makes some observations on the quantity of food consumed by the horse; but, with due submission, I cannot concur in his view of the relative proportions of hay and oats which that animal usually consumes. It is nearly double the quantity of hay that any horse ought to consume, and not much more than half the quantity of corn that a full-grown horse requires for the purpose of sustaining condition in moderate work. M. Liebig states "A horse, for example, can be kept in perfectly good condition if he obtains as food fifteen pounds of hay, and four and a half pounds of oats daily. If we now calculate the whole amount of nitrogen in these matters as ascertained by analysis (1·5 per cent. in the hay, 2·2 per cent. in the oats), in the form of blood, that is, fibrine and albumen, with the due proportion of water in blood (80 per cent.), the horse receives daily no more than four and a half ounces of nitrogen, corresponding to about eight ounces of blood. But along with nitrogen, that is, combined with it in the form of fibrine or albumen, the animal receives only about fourteen and a half ounces of carbon. Only about eight ounces of this can be employed to support respiration, for with the nitrogen expelled in the urine there are combined in the form of urea three ounces, and in

the form of hippuric acid, three and a half ounces of carbon."

"Without going further into the calculation, it will readily be admitted, that the volume of air inspired and expired by a horse, the quantity of oxygen consumed, and, as a necessary consequence, the amount of carbonic acid given out by the animal, is much greater than in the respiratory process in man. But an adult man consumes daily about fourteen ounces of carbon; and the determination of Boussingault, according to which a horse expires seventy-nine ounces daily, cannot be very far from the truth.

"It is obvious that in the system of the graminivora, whose food contains so small a proportion relatively of the constituents of blood, the process of metamorphosis in existing tissues, and, consequently, their restoration or reproduction, go on far less rapidly than in the carnivora."

This last sentence deserves particular attention, as it explains the reason why time is so positively necessary for the production of muscle in the horse.

Taking into consideration the effect which certain kinds of food produce on living animals, it may be turned to advantageous account by a strict observance of the state or condition of each horse. Their constitutions vary; and circumstances will also at times produce great changes. Various

kinds and degrees of illness will occasion loss of muscle and fat. Under such circumstances, those kinds of food ought to be presented which will restore the animal to its proper state; that, however, can scarcely be accomplished till the origin of the evil be eradicated. If a horse at any age exhibits too great an abundance of fat, accompanied with plethoric indications, it is evident that the food with which he is supplied abounds too copiously in particles contributing to form that substance. When this prevails to a great extent, it is done at the sacrifice of muscle, and those fibrous textures which render the horse valuable. This is clearly proved by experience; and I am sure every trainer will bear me out when I state, that when a horse, especially a young one, has been made very fat, as soon as he is put to work, he "falls off," as it is termed, loses his muscle, and, unless great care be observed, his soft flaccid sinews and joints give way. A great length of time must be expended on animals so treated before they can be brought into a proper state to be trained. Fat may be produced, if the animal be healthy, in a comparatively short period with some kinds of food, such as clover, vetches, and luxuriant grasses in the summer months; but it is a proceeding that never can be recommended. In this manner horses are usually made up for sale, when the

purchaser is under the necessity of resorting to physic and long-continued exercise, before the animals are available for the purposes of work.

On the other hand, there are some horses which do not generate a sufficient quantity of fat to be conducive to their health, and with young stock to the vigorous development of their bodies. It is attention to the just medium that indicates the skill exercised in the management of the animals, and which consequently promotes the success of an establishment. All huntsmen know the importance of having every hound brought to an equal standard of condition. It is accomplished by a judicious distribution of food. The constitutions of hounds vary as much as the constitutions of horses. If it is necessary to observe these minutiæ in kennel management, to develope the utmost powers of the hounds, how much more essential is it in the stud farm, to bring forth the greatest amount of power and value in the horse, in order to render the undertaking profitable. One of the great errors which farmers too frequently fall into, is that of turning their young horses into luxuriant pastures during the summer, where they become overloaded with fat; and, in the winter months, not giving them a sufficient quantity of nutritious food: thus not only are the constitutions of animals so treated impaired, but

their symmetry and proportions are sadly deteriorated.

There are certain laws indispensable to animal life, certain functions which must be carried on; and that kind of food must be supplied which experience has shown to be best adapted for this purpose, the proportions being determined by investigating the effects which they are calculated to produce. It is incompatible with the laws of nature to present food in too highly concentrated a form. Thus in the human subject brandy and other strong spirits taken undiluted are injurious, as also the nutritive properties of meat highly concentrated in the form of soups, without the addition of bread. The vital power in a living animal is sustained by the food consumed, and causes the growth or development of muscle and other members upon which exertion is dependent. This development is augmented by a judicious proportion of exercise or work; but it must be assisted by food of an appropriate character. There is a constant expenditure of certain principles, of which every living creature is composed; and this is ordained for the purpose of allowing the system to be replenished by food. These expenditures or exhalations are increased by exercise. The first conditions of animal life are nutritious matter and oxygen introduced into the system; the food, therefore, must be of that kind

which is compatible with the constitution, the nature of the animal, and the climate which he inhabits. The quantity of oxygen inspired is affected by the atmosphere, which contains more in winter than in summer.

Herbivorous animals swallow more air with their food than carnivorous ones; they require more saliva for the process of mastication; and that saliva contains a great portion of air, which may be understood by its frothy appearance. This is observable when a horse is eating his corn. The froth is composed of an infinity of little bubbles, each of which is filled with air, and by that means a quantity of oxygen is conveyed into the stomach with the food. Hence it is a most improper practice to wet the corn for a horse when it is put into the manger. The nutritive portion of the food which an animal takes into its stomach becomes soluble, in which state it enters into the circulation. The oxygen of the air, and the fluid secreted by the coat of the stomach, produce this result. Physiologists have decided this to be the case, and that it is a chemical action, free and independent of muscular power or vital force. This is an important fact to be understood, as many persons conceive that the process of digestion is formed by a muscular action of the stomach. The gastric juice seems to possess a most extraordinary power in dissolving or digesting all kinds

of food, a power which no other fluid possesses, be it water, acid, or alkali. It appears that these powers and quality are diminished by water being presented immediately before or after feeding,—a custom which, on that account, should be most scrupulously avoided.

Animals expire more carbon in cold than in warm weather; consequently they require food of a different quality in winter to that which is suitable to them in summer. The carbon protects their organs from the action of oxygen, which, but for that, would be fatal. The fruits upon which the natives of the warm climates usually feed, when fresh gathered, contain scarcely more than twelve per cent. of carbon; but the fat and train oil consumed by the inhabitants of the arctic regions contains more than five times that amount. Thus, a distinction may be drawn between the use of grass and hay in summer and in winter. As muscular fibre, and certain other tissues composing the animal frame, are exhausted by carbon and hydrogen, in the form of perspiration and the ordinary evacuations, increased by exercise or labour, so they require to be continually resupplied by food. The blood, the muscles, and other portions of the frame are by this process being constantly renewed. The greater the proportion of exercise and labour which the animal undergoes, the greater quantity of nourishment is

required; up to a certain point, the more frequently that renovation is produced, the more perfect will be the health and condition of the horse. That food which contains the nutritive properties in too great abundance, soon shows its effects on the animal partaking thereof: the blood-vessels become distended, and the other channels are overcharged with an excess of their fluids. Upon the appearance of this recourse must be had to medicines calculated to relieve the system from the accumulation, assisted by temporary abstinence, otherwise the health of the animal becomes deranged. The object, in this case, of supplying blood capable of conversion into muscle, and other requisite substances, is defeated.

From these facts it will be readily understood that young animals, in order to increase their growth, and the development of their muscles and other portions of their frames, require a certain quantity of food, and oxygen, which they derive from the air they breathe; moreover, that the extent of that development will in a great measure depend upon the properties of the food with which they are supplied. All the different kinds of food with which the horse is supplied have a tendency to produce fat; it is a substance which must exist to a certain extent; there is no kind of food that will create blood of a quality convertible into muscle, that will not, at the same time, deposit as much or more fat than is generally desirable.

It has been ascertained that such vegetables as afford nourishment to animals abound most with nitrogen, and therefore they require the least quantity of those which contain the largest proportions. On reference to Boussingault's analysis of the component elements of hay and oats, in one hundred parts of the former, one and a half of nitrogen are found; in the same equivalent of the latter, two and a half are detected: thus the excess of nitrogen in oats, as compared with hay, is in the ratio of five parts to three.

The relative properties of the different kinds of aliment presented to the horse will afford the best criterion in their selection, under any peculiarity of circumstances, in order that certain effects may be produced. In fresh grass, for example, there is a vast difference compared with hay, although the hay may have been made from grass which grew on the same land. The grass, when fresh cut, is full of sap or moisture; and although it contains nearly similar elements of nutrition to hay, yet they do not abound in anything like a proportionate degree: a much greater bulk of grass than of hay must be consumed in a given time to afford that nourishment which the animal requires; and as the digestion of grass is very quickly carried on, the horse must be almost constantly eating to enable him to consume a sufficient portion; the result of which is, that the stomach, and especially

the bowels, are distended to an inordinate degree. On this account, grass never ought to be used as the only sustenance of brood mares, inviting as it may be in the summer season. An unrestricted allowance of grass emaciates the muscular system and substitutes a quantity of fat, which, to a superficial observer, may not at first be regarded as very objectionable; but, as it is universally admitted that the embryo offspring of all living creatures partakes to a great extent the nature of the mother, is it not natural to conclude that the unborn foal will participate greatly in those physiological attributes, which are governed by the quality of the food upon which she is sustained? An unhealthy mare cannot be expected to produce a robust foal; therefore, the more perfect the health and constitution of the dam, so much the greater expectation there is that her produce will derive those benefits during the entire period it receives nourishment from that source. All the attention that can possibly be devoted to the management of a stud, the comfort and convenience of the buildings in which horses are kept, will be of no avail unless they are supplied with food suitable to their constitutions, and that food regulated according to their condition and the season of the year.

The main elements in hay and corn from which the equine tribe derive their nourishment are sugar

and starch; the former principally contained in the hay, the latter in the oats. Analyses have been made of the relative proportions of saccharine matter in hay; but it differs materially in that made from different land, and from the same land in different seasons: it is therefore a fallacious guide. Neither would it be practicable to ascertain the proportion of nutriment contained in one rick of hay compared with another, by the experiment of analysis. The same observation holds good with regard to oats.

But it is necessary to remark, that hay which abounds most in saccharine properties, is not the kind to be selected for rearing blood stock with; such having too great a tendency to create fat. When it must be given, it should be offered in sparing quantities. Such hay is usually the growth of meadows on the banks of rivers, often objectionable from another cause, that of containing sand—the deposit of floods. The hay that is to be preferred is the produce of sound upland turf, that has been laid down some years, on a dry chalky soil, or light loam. The process which it undergoes in making and in the rick, demands attention in the selection of this important article. If it be overmade, that is, submitted to a vast amount of evaporation, by which the most valuable juices of the grass are expended before it is formed into a rick, although it may

cut out of a very nice colour, the heating process, which divests the grass of a great portion of its hydrogen, is not satisfactorily accomplished. On the other hand, if not made sufficiently, it will become overheated in the rick, or mow-burnt, as it is termed, in which state it is still more objectionable. When hay is to be purchased, it is far better to exceed a trifle of the market price for that which is really good, than to take an ordinary quality at a very considerable reduction.

Hay made from clover contains a considerable amount of the saccharine principle; it is likewise liable to produce flatulence and colic, for which reasons it is not to be chosen, unless under peculiar circumstances, when the necessity of a change is indicated, and it should then be presented only in small quantities.

On the chalky soils of Sussex, Hampshire, Dorsetshire and Wiltshire, great quantities of saintfoin hay are cultivated. It is said that it will not flourish unless chalk prevails. On that point I cannot pronounce an opinion, and am rather sceptical about it, for I am quite certain that many acres are cultivated in the aforesaid counties in which chalk does not constitute the substratum. It is highly eulogised by those who grow it, as food for horses, and certainly with good reason; for, as a change, it is no doubt superior to any other kind of artificial grass when

converted into hay; and I entertain an opinion that there are many counties in which it is not cultivated, where it might be introduced and grown to advantage. No kind of hay should, on any account, be given to horses till after January ensuing the season in which it is made.

To select the sample of oats which contains the greatest amount of nutriment requires nothing more than ordinary experience. Upon the principle that the nourishment is derived chiefly from the starch which they contain, those which abound most in farina or meal are of course the most eligible. If sweet and clean, that is, thoroughly freed from dust, which should be very carefully attended to in the use of all descriptions of horse corn, black oats are quite as good as the white ones; and there is no doubt, in samples of equivalent weight and bulk, the meal of the black oats abound equally, if not more abundantly, with starch than the white oats. Like hay, they should be kept by all means till after Christmas, or even longer than that, in the rick, before they are thrashed. For the purpose of rendering oats whiter, and also of drying them, corndealers sometimes submit them to a process on the kiln, when sulphur is thrown on the burning coke beneath, as the agent by which the bleaching process is carried on. A vapour escapes from the burning sulphur, which is, in fact, sulphurous acid gas; that, whilst it

renders the oats white, being absorbed, renders them very unwholesome. Experienced persons can detect them, when so prepared, by their peculiar dryness, colour and smell. Irish oats generally undergo this process, and I suspect most others that are shipped; whilst another objection arises from oats brought into the market through such a medium, that of their lying together in a great bulk, which causes them to heat, and afterwards to smell disagreeably and musty. Under all these circumstances, if the land occupied in connection with a stud farm does not produce a sufficient quantity of oats for the consumption, it is far more desirable to purchase from farmers in the neighbourhood, or from dealers who are known to have procured them from those sources.

Many very important advantages arise from the practice of bruising oats before they are given to horses of any kind; and I will not even exclude those which are in training, although I am aware it is not done by the first and most experienced practitioners of the art, who cling to ancient usage. As to the advantages of the system for young stock, there is not the least doubt. Prejudice has, unquestionably, operated materially against its more general adoption, as it often does on many other equally beneficial occasions. There are persons who contend, that although many oats pass through the horse in an undigested form,

the stomach of the animal has extracted the nutritive properties. But two well-known facts will, it may be imagined, upset this notion at once. Oats which have been voided in that state will grow, and poultry and birds of the air will thrive upon them; they must therefore contain the elements of vegetation and nourishment. Moreover, as it is the farina embodied in the oat which contains the property of conversion into starch, the principle from which nourishment is derived, and that farina is found to be identically similar in oats which have passed through a horse to that in oats which have never undergone such an ordeal, very little argument would appear to be necessary for the conversion of the sceptical, unless prejudice interfered.

It is almost unnecessary to remark that the motive of this recommendation arises from the fact of horses passing a number of oats which have escaped the process of mastication and digestion; and that it is to render all the oats that are taken into the stomach subservient to those powers. By bruising the oats, two important advantages may be gained; the avoidance of any unnecesary distention of the stomach and bowels by the presence of extraneous matter, and also that of waste by the ejection of food which may not be profitably consumed, or turned to nutritious account.

Under an impression that only such oats as may have escaped the process of mastication are voided whole, many persons adopt schemes which they consider calculated to ensure that operation, but none of which have I ever found to be satisfactory. The introduction of a handful of cut hay or straw, in every feed of corn, is no security whatever for the perfect mastication of the oats, as daily observation will testify. Spreading the corn thinly over an expansive surface of a large manger is equally fallacious; because a horse disposed to feed gluttonously will, with his nose, drive it up into a heap, or he will collect with his lips as much corn into his month as he thinks proper before he commences the operation of mastication.

The opponents of bruising oats argue, that by so doing, the powers of mastication are not so energetically called forth as when they are given whole; and, therefore, that the saliva is not carried with the food into the stomach in such quantities. But it appears, from a circumstance related by Dr. Paris, in his "Treatise on Diet," that the process of mastication is not necessary to the flow of saliva; for that, in the case of a felon who cut his throat in prison in such a manner that although it did not immediately destroy his life, yet caused the food, when introduced into his mouth, to escape by the external wound, it was found that during each meal there was a dis-

charge of saliva from his mouth, amounting to five or six ounces, and sometimes more. The flow of saliva in the mouth, created by the sight of, or sometimes even by anticipation of any relishing delicacy, is well-known. Yet, even if mastication were essential to the promotion of a flow of saliva, if the oats are only just cracked or bruised—not ground to flour—the horse's masticatory powers will be sufficiently brought into action, and each mouthful of oats duly saturated with the fluid, before they can pass into the stomach; for it seems to be one of the provisions of nature, by which animal economy is governed, that food shall not pass down the throat in a dry state. By way of example, when the mouth is dry and parched with thirst, take a piece of bread or biscuit, and all the chewing and mastication in the world will not enable you to swallow it until it is moistened, either by a flow of saliva (which sometimes cannot be obtained, and which proves that mastication or the action of the jaws does not on all occasions produce it), or until water or some such fluid be taken to assist deglutition.

Independently of the advantages which the animals derive from having their oats bruised, there is another very important circumstance attendant upon this practice;—that is, economy. At least one fourth of the quantity will be saved by having them bruised, and with that saving, more satis-

factory results will be produced. It may be readily done on the premises, as the oats are wanted for use, by a machine worked by hand or horse power. The magnitude of the stud will of course dictate which of the two will be most desirable.

Among blood stock, beans are not very extensively consumed at any age; but there are circumstances under which they may be given with great advantage. They possess more tonic properties than any other kind of food; and for an animal whose muscle is flaccid, and exhibits a want of tone and constitution, they may be given even to yearlings with good effect. They must of course be split, especially for young stock.

The balsamic properties contained in bran, when properly prepared in the form of a mash, are calculated to render this article one of considerable consumption in the breeding department. During the winter season, mares, foals, and yearlings should be plenteously supplied, in order to regulate the condition of the bowels, and all the stock will be benefited by one or two mashes in every week, except when green food is being given. The nutritive property of bran consists in a mucilage, greatly enhanced, if not entirely produced, by the action of water at a boiling temperature: mashes should, therefore, be always prepared by water as hot as possible, well stirred, and allowed to stand

till sufficiently cool for use. By this plan all the good properties of the bran are obtained, but not otherwise. Bran mashes have the power of slightly relaxing the bowels; therefore, for the purpose of correcting the constipating tendency of hay and oats, they are particularly valuable; and preparatory to physic, they are given as the only food during the day previous to presenting cathartic medicine. It is necessary to observe, that bran should never be given in a dry state; until it has undergone the influence of boiling water, the mucilage is not formed, nor can the functions of the horse concoct that material. When given dry, the stomach can simply obtain the element of the mucilage, without the formation of the principle. There is yet another article which, in conjunction with bran, deserves to be strongly recommended;—that is, linseed. It is used to a certain extent in many establishments where horses are kept, but by no means so extensively as it ought to be. The mucilage obtained from boiling the seeds in water affords the best fluid that can be offered to the horse at any age; but especially for brood mares, after they have dropped their foals. In fact, for those which foal early in the year, it is indispensable. The seeds, after the mucilage has been obtained, may be introduced with great advantage in mashes, especially to horses of a costive habit. When the very trifling

expense incurred by using linseed is compared with the great benefits which it produces to the animals supplied with it, there is no reason why it should not be used nearly all the year round, especially for the young stock. One pint of linseed will form gruel of a sufficient consistency for a horse per diem, and the same quantity will be enough for two yearlings. By boiling the linseed, a small portion of the oil is obtained as well as the mucilage. In making this preparation the water should be made to boil and the linseed thrown in and stirred while over the fire, and it should continue to boil from twenty minutes to half an hour; it is quite a mistake to imagine that the qualities of the seeds are extracted by pouring boiling water upon them.

Of the effects produced by the extensive use of carrots, allusion has been made on a former occasion. Their use can only be sanctioned in sparing quantities, and better, perhaps, it would be, if they were entirely excluded from the dietary of the horse. Their nutritive properties must be attributed to the saccharine matter which they contain; what constitutes the injurious portion which experience assigns to them, I am not prepared to state, unless it be an acrid property, which disorders the stomach. Swede turnips and parsnips may be employed with advantage, as an occasional variety of diet, when the propriety of a cooling

regimen is indicated, and a slight tendency to diuretic and laxative evacuations is required. The various descriptions of grasses come next under review, as summer food for mares, and in sparing quantities for yearlings, or those of more advanced ages, which are not designed for training. Presuming the paddocks to be merely devoted to the purposes of exercise, artificial grasses must be provided, a system which will be found conducive to the health of the stud, and likewise to economy. Two acres of land, so managed, will produce more keep than five acres, over which stock of any kind is permitted to roam at pleasure. It is by the observance of this system that a profit is to be gained, and by which, also, many farms which are exclusively arable, producing nothing but grain, may be so managed as to carry a vast quantity of stock.

The nature of the soil must determine the class or species of grass which will be most productive; always bearing in mind that wet lands are not calculated to raise food upon for horses, except those of the coarser kinds adapted for purposes of draught. Lucerne will not flourish upon clay soils, or, in fact, upon any which are retentive of wet. Where it will grow, I have no hesitation in pronouncing it the best description of green food that can be given to any horses, especially to brood mares. It appears to possess a bitter, in all probability, a tonic character suitable to the consti-

tution. Clover and vetches must be provided if the land be not suitable for lucerne, or if there be not a sufficient breadth of the latter, and likewise as a change which is certainly desirable. In the early part of the summer, from the succulent nature of the two first named plants, flatulence is often produced, and also considerable distention of the bowels, in consequence of the large quantity required to obtain a sufficiency of nourishment: this is not so much the case as the season advances. The properties of saintfoin appear to be more nearly allied to those of lucerne: in the districts where it is cultivated, the latter plant is scarcely known; and where lucerne flourishes saintfoin is seldom seen. This is a circumstance rather difficult of explanation, because the land which appears calculated for one, seems to be equally so for the other.

Having so far attempted to investigate the sources from which nourishment is derived, I will conclude this section with the following remark. As it is laid down that the nourishment of the body is derived from the ingredients of the blood, —that those substances alone can be estimated as nutritious which are capable of conversion into blood, and hence that the quality of the blood is dependent upon the elements of which the food is composed, —the knowledge of the descriptions of food which contain the greatest relative proportions

of those elements which are adapted to increase the growth and development of certain portions of the animal, which are best calculated to augment his utility and value, becomes worthy of inquiry, in order to make a judicious selection. A race horse, a hunter, and a fox-hound, require food calculated to form muscle, bone, and sinew; yet it is not proper at all times to supply them with food abounding only with those principles, and thus a change is necessary. Age and condition, and the proximity to the time when their active services will be required, must be permitted to exert an influence, and the nature of the food should be regulated accordingly.

Having thus far attempted to describe, to the best of my ability, the most important subjects connected with a breeding establishment, it only remains for me to remark that much of the prosperity attendant upon such an undertaking will be derived from the care and skill devoted to the cause. Whether a man keeps twenty brood-mares or only one, they and their produce demand precisely similar attention: and success or failure will depend upon the care bestowed upon them. It is not for me to assert, that every detail or suggestion which I have offered, if carried out,

will be invariably attended with success; but I have, in most instances, endeavoured, as concisely as possible, to assign reasons for the recommendations which I have given; and I sincerely trust, that such of my readers who may adopt them, either wholly or in part, may have the satisfaction of obtaining favourable and profitable results.

THE END.

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